Google

This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

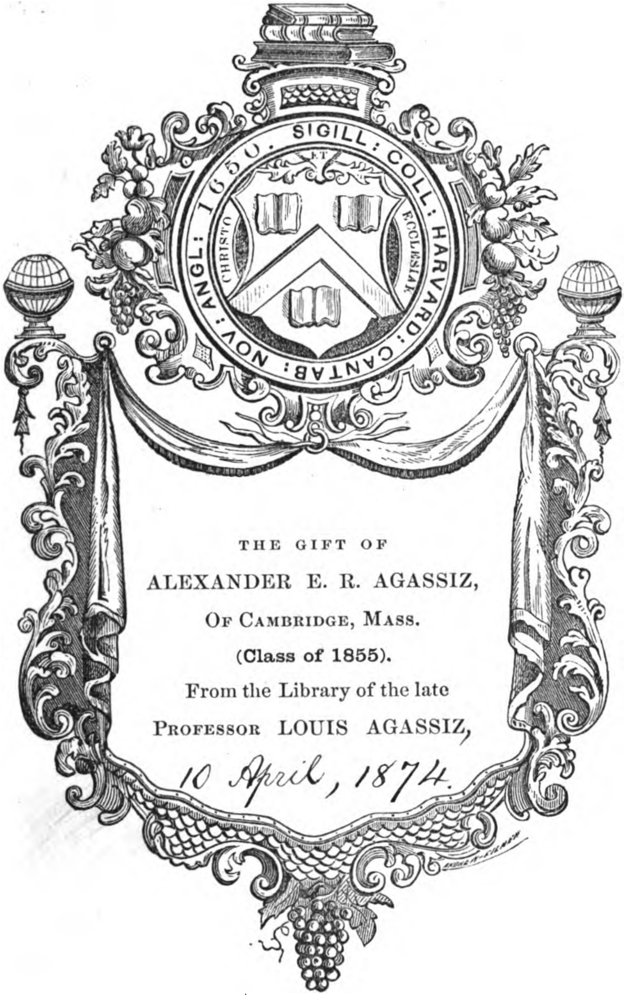
About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

~~421~~

LSoc4501.5

Bd. 1874


SIGILL: COLL: HARVARD: CANTAB: NOV: ANGL: 1650.
CHRISTO ET ECCLESIAE

THE GIFT OF
ALEXANDER E. R. AGASSIZ,
OF CAMBRIDGE, MASS.
(Class of 1855).
From the Library of the late
PROFESSOR LOUIS AGASSIZ,
10 April, 1874.

MONTHLY NOTICES

OF

Papers and Proceedings

OF THE

ROYAL SOCIETY

OF

TASMANIA,

FOR

1871.

TASMANIA:
PRINTED AT THE "MERCURY" STEAM PRESS OFFICE, HOBART TOWN.
1872.

MONTHLY NOTICES

OF

Papers and Proceedings

OF THE

ROYAL SOCIETY

OF

TASMANIA,—

FOR

1871.

TASMANIA:
PRINTED AT THE "MERCURY" STEAM PRESS OFFICE, HOBART TOWN.

1872.

LSoc4501.5

1874, April 10.
Gift of
Alexander E. R. Agassiz,
of Cambridge, Mass.
(Class of 1855.)

Contents.

Page
Proceedings for March, 1871 5
Letter from Dr. Wallace on Sericiculture 7
Letter from Dr. Story, Swansea, on cultivation of Cork-Oak, and Squill in Tasmania... 8
Proceedings for April, 1871 10
Letter from Mr. McIntyre on Alum from Brook's Creek, Tasmania ... 10
Remarks on Rev. H. D. Atkinson's Paper on the Geology of Bruni Island 11
Proceedings for May, 1871 12
Letter from Mr. Ellery, Melbourne, relative to Eclipse Expedition to Cape York Peninsula 12
Carnivorous Marsupials, alleged existence of, on Bruni Island... ... 13
Observations on the Progress of the Salmon Experiment. By Morton F.Z.S., F.L.S. 14
η Argus and its surrounding Nebula, &c. By F. Abbott, F.R.A.S., &c. 17
Proceedings for June, 1871 23
Journals of House of Commons, 1644 24
Discussion on Sugar-Beet Cultivation 24
Cork, growth and preparation of 24
Mulberry Tree, cultivation of, in China and Japan 26
Freshwater Mollusks, new Genus of... 27
Proceedings for July, 1871 27
„ August, 1871 29
Destruction of Rabbits on Sheep Runs, best mode of, discussion on ... 30
The Sugar-Beet. By. F. Abbott, jun., Superintendent Botanic Gardens 31
Sheep-breeding. By S. Smith Travers 34
The Salmon Trout. By M. Allport, F.Z.S., F.L.S. 43
Rabbits. By Mr. John Bisdee, of Hutton Park 46
Proceedings for October, 1871... 49
Presentation of Books received from America 50
Sugar-Beet, value of, as food for cattle 51
Letter from Hon. J. Maclanachan on Rabbit Nuisance 51
Export of Rabbit Skins 52
Letter from F. S. Corrance, Esq., M.P., on Salmon Experiment in Tasmania 53
Proceedings for November, 1871 54
Travertine from Dunrobin 54
Letter from Mr. S. Travers on a method of preserving the vitality in Eggs for a lengthened period of time 55
The Islands in Bass's Straits. By Charles Gould, Esq., F.R.S. ... 57
η Argus and its Nebula. By F. Abbott, Esq., F.R.A.S., F.R.M.S. 68
List of Fellows 78
Minutes of Annual General Meeting... 82
Report for 1871 84
Balance-sheet for ditto 89
Books purchased and presented 90
Presentations to Museum 92
Plants and Seeds received at Gardens 95
Ditto sent from Gardens 96
Tench ditto 96
Plants supplied for decoration of Public Places 96
Plants introduced into Society's Gardens during the year 97
Meteorology for March, 1871 ... ... i.
Notes on the Meteorology and Mortality for the month of March, 1871 ii.

Page.
Meteorology for April, 1871 ... ... iv.
Notes on the Meteorology and Mortality for the month of April, 1871 v.
Meteorology for May, 1871 ... ... vi.
Notes on the Meterology and Mortality for the month of May, 1871 ... vii.
Meteorology for June, 1871 ... ... ix.
Notes on the Meteorology and Mortality of the month of June ... x.
Meteorology for July, 1871 ... ... xii.
Notes on the Meteorology and Mortality of the month of July, 1871... xiii.
Meteorology for August, 1871 ... ... xv.
Notes on the Meteorology and Mortality of the month of August, 1871 xvi.
Meteorology for September, 1871 ... ... xix.
Notes on the Meteorology and Mortality of the month of Sept., 1871 xx.
Meteorology for October, 1871 ... ... xxii.
Notes on the Meteorology and Mortality of the month of October, 1871 xxiii.
Meteorology for November, 1871 ... ... xxv.
Notes on the Meteorology and Mortality of the month of Nov., 1871 xxvi.
Meteorology for December, 1871 ... ... xxix.
Notes on Meteorology and Mortality of month of December, 1871 ... xxx.
Meteorology for January, 1872 ... ... xxxii.
Notes on Meteorology and Mortality of month of January, 1872 ...xxxiii.
Meteorology for February, 1872 ... . xxxvi.
Notes on Meteorology and Mortality of month of February, 1872 xxxvii.

Errata.

Page 23.—Omit the twenty-ninth line, "The Secretary read the following."

Page 60.—Fifth line of fifth paragraph, for "rugs in the granite," read "vugs in the granite."

Page 61.—Second line of ninth paragraph, for "rugs," read "vugs."

ROYAL SOCIETY.

MARCH, 1871.

A monthly evening meeting of the Society was held on Tuesday the 14th March; Morton Allport, Esq., in the chair.

The following gentlemen, who had been previously nominated by the Council, were, after a ballot, declared to be duly elected as Fellows of the Society:—Mr. P. Irvine, Hobart Town; Mr. Jamieson, Hobart Town; Mr. J. Rule, Bellerive, Kangaroo Point; Mr. J. Milward, Hobart Town; Mr. John Macfarlane, Hobart Town; Mr. James Macfarlane, Hobart Town.

The SECRETARY laid on the table the following returns:—

1. Visitors to Museum during January and February, 1788.
2. Ditto Gardens ditto, 4366.
3. Plants, &c., sent from Gardens.
4. Tench ditto.
5. Books and periodicals received.
6. Presentations to Museum.

Meteorological Returns:—

1. Hobart Town, from F. Abbott, Esq., tables for January and February.
2. Port Arthur, from J. Boyd, Esq., ditto.
3. Swansea, from Dr. Story, ditto.
4. Westbury, from C. Belstead, Esq., ditto.
5. New Zealand, from the Government, ditto for 1869, and October, November, and December, 1870.
6. Sydney, from H. C. Russell, Esq., Government astronomer, table for December.
7. Melbourne, from R. Ellery, Esq., tables for December, 1870, and January, 1871.

"Notes on the Meteorology and Mortality of the Hobart Town registration district for March, 1871," by Dr. E. Swarbreck Hall.

The presentations to the Museum were as follow:—

1. From L. S. Travers, Esq., Collection of specimens illustrative of the Carboniferous system of New South Wales, with notes by W. Keene, Esq., F.G.S.
2. From Captain Williams, of the American whaler Osmanli, a collection of Shells from Fiji, also a War Club from the same place.
3. From Mr. W. E. Baynton, Land Shells from Brown's River.
4. From Mr. J. Buckland, Skin of Monitor Lizard.
5. From Master Hull, Nest and eggs of Honey Eater.
6. From Jas. Scott, Esq., M.H.A., nine stone implements made by aborigines of Tasmania, from Macquarie River (with a note).
7. From Mr. T. B. Handley, a Harpoon, much twisted, found in a nine tun whale captured off Macquarie Harbour by Captain Smith, of the Maid of Erin.
8. From Mr. Rowntree, polished specimen of Native Myrtle *(Fagus Cunninghamii)*.

9. From the Hon. the Minister of Lands and Works, a sample of Stone Alum from Brooks' Creek, Black Boy.

[The SECRETARY observed that no information was forwarded with the specimen as to the quantity which could be obtained, or the expenses which would be incurred in purifying it on the spot, or in forwarding it to a shipping port for exportation to Melbourne or England, for the purpose of preparing it for the market. He had been informed by Mr. Justin Browne that purified alum was worth about 10s. 6d. per cwt. in the English market. On the whole, however, he feared from what he had occasionally learned that our supplies of alum, which occurred in various localities in the island, were not so accessible or in sufficient quantities to be of any economic value.

Mr. Justin BROWNE said the common alum was worth from 9s. to 10s. per cwt., and the refined about 56s. There were only two localities in Britain where it was prepared, Whitby and Hurlett, which furnished upwards of 4,000 tons annually. About 7,000 tons were also exported annually from China. [Full information on the subject of alum can be obtained on reference to Ure's Dictionary of Manufactures, and Muspratt's Chemistry.]

10. From Mr. Nash, Kangaroo Point, a German Lottery Ticket.
11. From R. C. Read, Esq., New Norfolk, specimen of black marble from the Florentine Valley, River Gordon.
12. From Mrs. W. Giblin, two specimens, male and female, of the Sydney Parrot, or King Lory *(Aprosmictus scapulatus.)*
13. From Mr. W. M. Campbell, Port Cygnet, a White Hawk *(Leucospiza Novæ Hollandiæ.)*
14. From Frederick T. Walker, Esq., Rhodes, a bow, 6 arrows, and a branch of coral used as a club, from Tanna, New Hebrides. Two clubs, 2 pieces of Tappa cloth, 3 mats, a pillow, 3 pieces of sponge, a sample of sugar cane, a piece of Angora root (from which the drink called Kava is made), and 2 beetles, from Fiji.
15. From the United Happy Valley Company, per M. Seal, Esq., a specimen of auriferous quartz from Christmas Reef (very rich); ditto from New Reef, Ovens, Victoria.
16. From Mr. Gates, Jerusalem, a Diving Petrel *(Puffinaria urinatrix)* caught in a corn-field at a considerable distance inland. [These birds have occasionally been found in similar situations, having probably been driven in from the coast by stress of weather.]
17. From Mr. W. Smith, Port Davey, portions of skull of Sperm Whale, 1 pelvic bone of ditto, ear bone of whale, curiously twisted saplings from Port Davey, nest and eggs of White-shafted Fantail, *(Rhipidura albiscapa.)*
18. From Captain Fisher, of the Wild Wave, portion of tusk of Mastodon, from Siberia. [This specimen was found underground in lat. 65 N., long., 167 E.; the length of the whole tusk was about 15 feet.]
19. From G. Stokell, Esq., perfect skeleton of a Sandwich Island native.
20. From Mr. J. Clark, a common rat caught by a mussel on a pile of the fish market wharf. [The mussel had closed its shell with one toe of the rat between the valves, and so held it firmly until it was observed and destroyed. The mussel retained its hold for two days after removal from the pile, and then the valves had to be prized open with the point of a knife.]
21. From Mr. Oscar Hedberg, tanned skin of a Jaquar (?)
22. From Mr. J. Tapp, ship Figaro, a Danish coin, 1 mark.
23. From Mr. F. Abbott, jun., a Blue Mountain Parrot *(Trichoglossus Swainsonii.)*

24. From A. Allison, Esq., Macquarie River, an eel of a bright golden yellow colour.
25 From Mr. M. Seal, fossil seeds from a recent tertiary formation at Haddon, near Ballarat, Victoria, found 120 feet from the surface, and about 5 feet above the sandstone or bed rock. [These specimens are of great geological interest; many of them are extremely perfect.]
26. From Mr. R. Thorne, Pittwater, two specimens of Spine-tailed Swift *(Acanthylis caudacuta.)*
26. From Mr. R. Wright, Glenorchy, one ditto.

The SECRETARY called the attention of the meeting to some packets of silk worm ova, silk cocoons, and documents containing recent information on the subject of sericiculture. These were presented to the Society by His Excellency the President. Dr. Agnew having intimated that they would lie on the table for some time, for the inspection of visitors, read the following letter, addressed to His Excellency by Dr. Wallace, of Colchester :—

"October 27th, 1870.

"His Excellency, C. Du Cane, Esq.

"SIR,—I have had the honor to write to you on former occasions in regard to sericiculture. I again take the liberty to direct your attention to the progress that industry is making in many of our colonies. Owing to the efforts of the Silk Supply Association most of our colonies have been stimulated to experiment and fresh exertions. The Cape of Good Hope, New Zealand, and part of Australia, are commencing to take up this industry on a secure basis, and I trust to hear that Tasmania will not lag behind. I expect to hear in a few days that my friend Mr. Charles Brady, of Curl Curl, Sydney, N.S.W., has received a grant from Government for his efforts during the last ten years in introducing silk culture successfully—as also that a similar grant has been made in New Zealand to the promoter there of that valuable industry—so valuable that in 1869 £300 clear profit was made off one acre in California.

"I have the honor to enclose my friend and colleague M. Teutschel's cards and circulars by this mail. He takes off my shoulders much of the active work, leaving me the foreign correspondence, experiments, &c. You will note that he offers to supply all that is wanting to intending experimenters, on receipt of draft or good reference. He also receives and disposes of, on commission, produce, such as cocoons and eggs, the latter if of good races proving most remunerative—as much as 15s. to 25s. for good eggs being paid in the Continental market.

"M. Teutschel has received, for sale, eggs from Japan, Australia, and expects others from New Zealand and the Cape. If eggs are sent, empty cocoons should be sent with them as samples to show the character of the parent stock, and the eggs guaranteed to come true to sample. He supplies reeling and mulberry-leaf cutting machines —the latter brought out by me this year is a great economiser of labour, very valuable in a colony. Sample cocoons of the races sent out by M. Teutschel this season shall be sent either *viâ* Brindisi, or by next mail. Supplies of eggs and seed may be had either direct from M. Teutschel, or, if small, on application to Mr. Charles Brady, of Curl Curl, Manly, Sydney, N.S.W., by mentioning my name, we supplying him.

"M. Teutschel has had eggs from Japan and Australia for sale in the Continental markets, and expects more in 1871, with supplies from New Zealand and the Cape.

"I trust to hear shortly of silk culture being undertaken in Tasmania, and M. Teutschel will be glad to assist by all in his power to develope the rich resources of the country as regards sericiculture.

"Will you kindly distribute his cards and circulars among those most interested in the new pursuit?

"Believe me to remain,
"Faithfully yours,
"ALEX. WALLACE, M.D."

Mr. Justin **BROWNE** said that, having read various papers that had been published on the propagation of the silk-worm with a view to the production of silk, he was able to state that the early numbers of the papers issued by the Silk Supply Association were now on the table of the Hobart Town Chamber of Commerce, where they could be examined by any person interested in the subject. The association was established by gentlemen in London largely interested in the silk trade, as well as by wealthy men who had retired from business. The enormous importations of silk-worms egg from Japan had supplied the Italian and French growers with grubs, but for which the culture of silk in France and Italy would have utterly failed, notwithstanding the researches of M. Pasteur, who had applied himself to the study of the cause of disease in the silkworm, and had perhaps found a remedy. A letter had lately appeared in the London *Times* directing attention to the restrictions placed upon the transmission of silkworms eggs through the post, and pointing out the injury that the silk culture of Europe would sustain if these restrictions were maintained, the Post Office having hitherto afforded a rapid and safe mode of conveyance from the East to Europe. A series of articles, written by Mr Cobb in *Morgan's Trade Circular* of July and August last, were especially worthy of notice. The writer quoting his experience in Italy stated that when the worms no longer needed mulberry leaves for food, the remaining produce of the trees was gathered and used for sheep and cattle food, the flavour of meat produced from mulberry leaf fed sheep being superior to that fed in the ordinary manner. The fruit, with some rice, formed almost the only food of the inhabitants while it was in season, and the tree grew successfully in hedge rows. The speaker went on to say that the late Mr. Stutzer had shown much more foresight than had been attributed to him, in advocating the growth of the mulberry tree, and the propagation of the silkworm, and had he remained in Tasmania, and lived to superintend the plantation made by him at the Orphan School, there would now, probably, have been some small export of silk or cocoons (for the latter are now preferred by English manufacturers) from this colony, as the product of a branch of industry carried on by inmates of that institution. The individual parcels of silk hitherto produced here were rather the result of amusement than of any attempt to open a new branch of trade.

The **SECRETARY** read a letter from Dr. Story, Swansea, on the desirability of introducing the cork oak, and the medicinal squill into the colony, for both of which he thought the climate very suitable.

Mr. **ABBOTT** remarked that a cork oak *(Quercus suber)*, about 14 ft. high, now in the Society's Gardens, flowered for the first time this year. From this a small supply of acorns will be obtainable by any one willing to plant them; but a large supply of the oak has been raised in Melbourne Botanic Gardens by Baron Von Mueller, from whom last year the Government received some young trees, which are now growing on Tasman's Peninsula. In addition to these, a few remain at the Society's Gardens for distribution. There is little doubt that Baron Von Mueller would furnish plants to any one who would bestow a sufficient amount of care on this valuable tree, as he thinks it will flourish in Tasmania.

[The medicinal squill *(Urginea scilla)* well thrives in the Gardens. Six bulbs were planted out last year, three of which have divided into two or three bulbs each.]

Mr. M. **Allport** read a paper entitled "Observations on the progress of the Salmon experiment."

Discussion followed, during which several of the Fellows expressed their gratification at the tangible success which had been achieved by the acclimatisation of the salmon trout *(Salmo trutta)*. As so few ova of this fish were received from England in comparison with the numbers of those of the *S. salar*, no doubt could be reasonably entertained that the introduction of the latter has been equally successful, although a specimen has not yet been caught; a circumstance at which no practical fisher, at all acquainted with the Derwent, can be astonished.

Mr. **Barnard** moved, that the thanks of the meeting were due to Mr. Allport for his highly interesting paper; and to Mr. Justin Browne, to whose remarks, particularly those on the subject of sericiculture, he was happy to listen. Although Mr. Stutzer was by some deemed a visionary for his efforts to establish silk culture at the Queen's Asylum, he had little doubt these efforts would bave been crowned with complete success had their author been spared to conduct them to their issue. It was still worthy of serious consideration, if the large amount of juvenile labor at the command of Government could not be very profitably exercised in establishing an industry which was so likely to be of advantage to the colony, both by absorbing a large amount of, at present, almost useless labour, and by furnishing a new and important article of export.

The motion having been carried, and a vote of thanks accorded to the various donors of presentations, the meeting terminated.

APRIL, 1871.

The monthly evening meeting of the Fellows was held on Tuesday, the 11th April, M. Allport, Esq., in the chair.

S. Smith Travers, Esq., who had previously been put in nomination, was, after a ballot, declared duly elected a Fellow of the Society.

The Secretary, Dr. Agnew, submitted the usual returns for the past month, viz. :—

1. Visitors to Museum, 998.
2. Ditto to gardens, 2,034.
3. Leafing, flowering, and fruiting of a few standard plants in the Botanic Gardens.
4. Books and periodicals received.
5. Presentations to Museum.

Meteorological Returns :—

1. Hobart Town, from F. Abbott, Esq., table and summary for March.
2. Port Arthur, from J. Boyd, Esq., ditto for March.
3. Westbury, from F. Belstead, Esq., ditto for February.
4. Sydney and other stations in New South Wales, from the Government Observer, printed tables for January.
5. Melbourne, from R. L. J. Ellery, Esq., table for February.
6. Great Britain, from the Meteorological Office, London, Quarterly Weather Report, part 2, 1869.

The Secretary read a communication from Dr. E. S. Hall, to the effect that he had been unable to prepare his usual analysis of the meteorological records, &c., in time for the meeting, but giving instead a short abstract of the general results, and promising a full return in a few days.

The presentations to the Museum were as follow :—

1. From Lieutenant Leefe, R.N., a small collection of shells from Fiji.
2. From Mr. S. Dove, a very large Mussel shell from the Derwent, near the New Wharf.
3. From Mr. John Gage, a skull, probably of an Aborigine, found on Mount Direction.
4. From J. Maclanachan Esq., M.L.C., a Carolina Duck (*Dendronessa sponsa*).
5. From Mr. R. Giblin, a Kingfisher (*Alcyone azurea*).
6. From Mr. M. Allport, a very large specimen of the Mantis, from North Coast of Tasmania.
7. From Sir Robt. Officer, a geological map.

The following letter from Mr. McIntyre was read in continuation of the subject, Alum, which was discussed at the last evening meeting.

"SIR,—Allow me to refer to the observations made at the last meeting of your Society, respecting the sample of stone alum from Brook's Creek, which I forwarded a few weeks back to the Hon. the Minister of Lands and Works. I find that the members present were at a loss as to the quantity of the mineral which could be obtained, the expenses incurred in preparing it for the market, and the expenses attending exportation to Victoria or England. The following I submit is an approximate of the cost :—Raising and crystallizing, 15s. ; transit to Launceston, 40s. ; freight to England, 20s. ; extra commission, &c., 5s. ; total, £4 per ton, and as to quantity thousands of tons are open to view. The quotations in England by last mail are £7 5s. and £8 10s., which would leave a handsome margin to exporters. I may, however, remark that I have written by this mail to several drysalters in Manchester, and when

I receive authentic information, I shall take the liberty of supplying you, on behalf of the Society, with the information I receive.

"I am yours respectfully,

"PETER McINTYRE.

"Launceston, 29th March, 1871."

The SECRETARY read a paper from the Rev. H. D. Atkinson, of Three Hut Point, entitled, "Some Remarks on the Geology of Bruni Island."

Mr. M. ALLPORT doubted if anything mentioned in the paper warranted the inference that there had been any long geological period of separation between the island and the mainland of Tasmania. The Flora, indeed, indicated a somewhat recent junction, that of South Bruni was identical with that on the opposite shore; the same was generally the case with North Bruni, and no special Flora whatever existed on the island. As to the carnivorous Marsupials he had been told by Mr. Graves and others that the Native Devil *(Sarcophilus ursinus)* had been seen in considerable numbers on South Bruni.

Mr. J. DAVIES corroborated Mr. Allport's statement as to these carnivora, as he had himself seen them in the locality indicated.

The SECRETARY called the attention of the meeting to the collection of fruit sent in from the Society's gardens, comprising about 108 varieties of apples, 60 of pears, and 4 of late plums.

Discussion of a conversational character ensued, and the business terminated with a vote of thanks to the Rev. H. D. Atkinson for his paper, and to the donors of presentations.

MAY, 1871.

The monthly evening meeting of the Society was held on Tuesday, the 9th May, M. Allport, Esq., F.L.S., F.Z.S., in the chair.

The following returns were brought under notice, viz. :—

1. Visitors to Museum during April, 817.
2. Visitors to Gardens during April, 2,050.
3. Time of leafing, flowering, &c., of a few standard plants in Botanic Gardens during April.
4. Books and periodicals received during April.
5. Presentations to Museum during April.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., table for April, with summary of observations.
2. Westbury, from F. Belstead, Esq., tables for March and April.
3. Swansea, from Dr. Story, table for March.
4. Port Arthur, from J. Boyd, Esq., table for April.
5. Sydney, from the Government Observatory, printed tables for February. Abstract of Meteorological Observations made in New South Wales, to end of 1869, by H. C. Russell, Esq., B.A., Government Astronomer.
6. Melbourne, from R. J. Ellery, Esq., table for March.

"Notes on the Meteorology and Mortality of the Hobart Town registration district for May, 1871," by Dr. E. Swarbreck Hall.

The presentations to the Museum were as follow :—

1. From Rev. Mr. Whitmee, two Mats as worn on festive occasions by women of Samoa.
2. From Mr. Barwick, Tea Tree, a specimen of Eyton's Duck (*Leptotarsis Eytoni*, Gould) found dead near Richmond.

[The occurrence of this bird in Tasmania is remarkable, and difficult to be accounted for, it being an inhabitant of the north-west coast of Australia. Gould states that "the farthest south it was afterwards met with was on the Albert River, in the Gulf of Carpentaria, in latitude 18° S."]

3. From Mr. W. Holmes, Jerusalem, a Parrot unusually marked.
4. From Mr. G. Whitcomb, a fine specimen of Kauri gum, from New Zealand.
5. From Mr. W. B. Watchorn, a Spider Crab.
6. From Mr. Lukin Boyes, a pair of Musk Ducks (*Biziura lobata*) shot at Austin's Ferry; a small Bat.
7. From Master A. Haywood, a Portuguese copper Coin, 1814.
8. From Sir R. Officer, a Land Rail (*Rallus pectoralis*) shot at New Norfolk.
9. From Mr. Robert Gatenby, Macquarie River, a male specimen of the Native Tiger (*Thylacinus cynocephalus.*)

The SECRETARY read the following letter from Mr. Ellery, President of the Royal Society of Victoria, and Government Astronomer :—

Royal Society of Victoria,
Victoria-street, Melbourne, 22nd April, 1871.

SIR,—A proposition has been brought before this Society for a joint expedition from the several Australian colonies to Cape Yorke Peninsula, to observe the total eclipse of the sun, which will take place on the 12th December next.

The scientific interest of this phenomenon is very great, and the points to be determined are important. As far as is known there will be no further total eclipse of the sun readily accessible from Australia during the remainder of the present century.

The proposal is that a steamer should be chartered to start from Melbourne about the 20th November, and touching at intermediate ports, to convey such persons as may desire to witness the eclipse.

It is expected that the total cost will not exceed £25 per head of those who form the party.

It is proposed that the expedition should be under the charge of the Government Astronomer, so far as the control of the steamer is necessary to prevent undue delay.

A committee of this Society has been appointed to make preliminary enquiries, and I have to request that you will have the goodness to make the proposal known, and to inform me how many gentlemen from Hobart Town are likely to join it.

I have the honor to be,
Sir,
Your most obedient servant,
ROBERT L. J. ELLERY,
President of the Royal Society of Victoria.

To the President of the Royal Society,
Hobart Town.

Mr. M. ALLPORT, in reference to the question of carnivorous marsupials on South Bruni, mooted at last meeting, begged to say he had recently been informed by Mr. Bennett (of Sandy Bay toll bar), that he had not only seen the native devil on Bruni, but had actually shot one when residing there some ten years ago. At that time, at least, they were pretty numerous, and appeared to haunt a portion of the shore where they could obtain portions of seal and whale flesh, left after the process of "trying out" the oil.

Mr. GRAVES had never actually obtained a carnivorous animal from South Bruni, but about 18 months ago he had seen from a boat a number of small animals like black rabbits on the shore there. He was puzzled at their appearance, and soon afterwards visited the spot again to make further examination. He could find no traces whatever of rabbits, but afterwards meeting with Mr. Bennett, he was informed by him that the animals were native devils, which was proved by the fact of his having shot one.

Mr. ALLPORT had himself seen one small carnivorous marsupial on South Bruni, the *Antechinus leucopus*, which also occurs in considerable numbers on Partridge Island. This too was an animal which must have been indigenous, and not introduced by the natives.

Mr. F. ABBOTT read a long and interesting astronomical paper, the subject being that of η Argus and its surrounding nebula, which was listened to with great attention.

Discussion of conversational character having taken place, a vote of thanks was accorded to Mr. Abbott for his paper, and to the donors of presentations, after which the meeting broke up.

OBSERVATIONS ON THE PROGRESS OF THE SALMON EXPERIMENT.

By Morton Allport, F.Z.S., F.L.S.

Since our last evening meeting several large fish have been taken by a fixed net in the Derwent, immediately below the mouth of the Plenty, which fish differed so materially from the trout caught in the Plenty and those retained in the ponds, as to induce a belief that a veritable grilse had at length been caught. The first of these fish, a female weighing 4½ lbs., was taken on the 26th December last, and is now before you. On a casual inspection, Judge Francis, Mr. J. Buckland, and I, each took this specimen to be nothing more than a well fed and exceedingly handsome river trout (*Salmo fario*), but upon careful examination of the teeth and fin rays, and comparing them with the descriptions given by Yarrell, I found that the teeth on the vomer were reduced to a single line, extending but a short distance back as they are found in the salmon trout (*Salmo trutta*), instead of being placed in a double alternating row, and extending far back, as they are found in the river trout (*S. fario*), whilst the numbers of the fin rays corresponded exactly with those of the salmon trout, and differed materially from those of the river trout. Yarrell gives such minute directions for counting the fin rays that it is scarcely possible to be mistaken in the number where the fish is as large as this specimen; but to guard as much as possible against error, Judge Francis kindly consented to check my figures by a separate examination, and arrived at the same result, as did Mr. Buckland on a subsequent occasion. As it was determined by the Commissioners to present this specimen to the Royal Society for preservation, I availed myself of the able assistance of our Curator, Mr. Roblin, and dissected out the pyloric appendages, the numbers of which seem to be relied upon as a good specific test by Dr. Günther, who gives 36 as the number for the river trout, whereas this fish has 42. The roe was found well developed, each egg being about the size of No. 4 shot. The next specimen, caught two days afterwards, was a female weighing 1¾ lbs., exhibiting the same characters as that last described, the vomerine teeth being those of a migratory salmon after its first trip to sea. The third specimen was a magnificent female fish, over 7 lbs in weight, identical in character with the first. This fish was in such excellent condition, and so much larger than we could exhibit in spirits, that the Commissioners determined to send it to His Excellency the Governor, that it might be put to what is after all the most practical test of its value to this colony, and his report of it was that it was little inferior to salmon in quality. The fourth specimen was a female rather over 2 lbs. in weight, which was sent to Captain Montgomerie, of H.M.S. Blanche; and the fifth and last is the small specimen now on the table, also a female, which differs slightly from the others, and the roe of which is not nearly so far advanced. It has been frequently noticed in English rivers that the first salmon trout which ascend from the sea to the fresh water are almost invariably females, and the whole five taken here being females would of itself furnish strong presumptive evidence that they belong to a migratory species. I must now revert once more to an earlier part of the experiment. It will be remembered that the last of the salmonoids, caught in the estuary of the Derwent in December, 1869, was sent to the Zoological Society of London for identification, because I believed that it had passed the smolt stage, and had attained such maturity as to render its classification no longer a matter of uncertainty. That specimen Dr. Günther at once declared was a true salmon (*S. salar*). I have already given my reasons for believing that this fish was spawned in this colony, and need not go over the same ground again; but will now refer to the two small specimens sent to England by the same opportunity, and which were hatched in September, 1869, from eggs deposited by the salmon trout (*S. trutta*), which had been unnaturally detained in fresh water. These two fish were parr about 8 months old, and in reference to them Dr. Günther wrote to Mr. Youl the following letter:—

British Museum,
14th November, 1870.

My Dear Sir,—According to my promise I examined the two small salmonoids about which I was in doubt the other day.

I shall shortly state the result of my examination. *Externally*, they agree with each other in every detail; they have the large scales on the tail of a *salmon*-parr (11-12 above the lateral line); and they agree also in all the other external characters with salmon-parr, and are very different from young trout, or sea trout. *Internally*, they differ from each other: in one of the specimens (*yours*) I find 54 pyloric appendages of the length usually seen in salmon-parr. In the other specimen there are only 36, and they are very short; such a number I have hitherto found in the common river trout only.

I remain,
Yours very truly,
(Signed) A. GÜNTHER.

To J. A. Youl, Esq.

We will throw over the one specimen which has the short number of pyloric appendages, and referring to the other we can only arrive at one of three conclusions—1st.—Salmon and salmon trout up to the smolt stage cannot be distinguished from one another by any scientific process at present known ; or 2nd.—Salmon trout detained unnaturally in fresh water have spawned, and produced a true salmon ; or 3rd.—We have accidentally, without our own knowledge, detained true salmon in fresh water, which, contrary to all former experience, have thriven and bred. Of these conclusions, the first seems the best, as it is borne out by the further progress of the experiment. One of the eleven parent fish was lately accidentally killed, and has been preserved. It is most certainly a salmon trout, and a beautiful specimen, exhibiting none of the deformity which is always apparent in these specimens of true salmon (*S. Salar*), which have been detained from sea for more than four years. A large number of the brethren of the parr, described by Dr. Günther, assumed the smolt dress in October last, and exhibited the usual restlessness, travelling round the pond seeking an outlet to get to sea, and one which jumped out and died on the bank is now before you. As time passed on these smolts did not (as true salmon smolts invariably do) revert to the parr markings, but grew apace, and assumed all the appearance and markings of the parent fish so completely as to leave not a shadow of doubt as to their species. Two beautiful samples are now on the table. Surely proof could not be stronger that the salmon trout can be detained in fresh water and reared in myriads with certainty. The parent fish, the smolt, and one of the young ones which has passed the smolt stage, will be sent to the Zoological Society by next mail, and will form one of the most interesting and practically useful exhibitions of pisciculture that the world has ever seen.

if any, alterations may have taken place in the nebula before

η ARGUS AND ITS SURROUNDING NEBULA, &c.

By F. Abbott, F.R.A.S., &c.

Read at a meeting of the Royal Society of Tasmania, 9th May, 1871.

In the last paper I had the honour on bringing before the Society I referred to a correspondence which was then pending on the star η, and the attached nebula, in the constellation Argo-Navis. It will be fresh in the minds of many of the members of this Society that authorities, previously quoted, have confirmed the alterations which have been recorded in this object. E. B. Powell, Esq., of Madras, writing to the Royal Astronomical Society some observations on the binary star α Centauri, has a concluding note thus:—"I have to observe that to Mr. Abbott must be ascribed the first publication of the fact that η is no longer in the dense portion of the nebula, where it was seen by Sir John Herschel."—(*Vide Monthly Notices R.A.S., Vol.* 24, *p.* 172.)

It was in March, 1865, that I first pointed out the fluctuations in this object, through the Melbourne equatorial, to Mr. Ellery at the Observatory, when the star η was out of the nebula, and the altered figure of the dark space was filled with 12th magnitude stars, richly coloured as described in Monthly Notices R.A.S., Vol. 25, p. 192.

Notwithstanding this in connection with all other evidence, strong opposing influences have been brought to bear against the movements which have been observed, although it is well known to every astronomer that there is nothing stationary in the universe. The distance of such objects as the nebula about η Argus is in all cases so immensely great, their position in the sky often unfavourable, and convenient times for observing so far apart, that any alteration or physical change may for centuries remain unknown.

The late Sir William Herschel writes, and is followed by Sir John, thus: "Gravitation still further condensing and so absorbing the nebulous matter, each in its immediate neighbourhood might ultimately become stars, and the whole nebula finally take on the state of a cluster of stars," &c.—(*Vide Outlines of Astronomy, 5th edition, p.* 640.) Mr. Procter considers that an increased or decreased distance in space may account for the fluctuations.

The present object was observed and faithfully recorded by Sir John Herschel when stationed at the Cape of Good Hope in the year 1837. It is quite impossible to say what, if any, alterations may have taken place in the nebula before that time, but it is certain that changes have taken place both in the star and in the nebula since 1854; and these fluctuations have been so great and unusual as to raise a doubt in the mind of Sir John Herschel as to their reality. This opinion, coming from such an authority, has influenced many others, who, notwithstanding all evidence, and without a single observation of their own, have refused to credit these recorded facts. Some also, who have but lately commenced observing, contrary to all scientific rule, ignore all previous observations made by others, in order to make an opening for their own.

To decide certain points of difference which are said to exist between the drawings made by Sir John Herschel, Lieut. Herschel, and myself respectively, referees have been appointed by the Council of the R.A.S. The present paper has relation to the observations made for, and the reply sent to, the referees, in answer to their queries on the points alluded to.

In carefully looking over the drawings taken at Bangalore by Lieut. Herschel, with the object, η Argus, 15° above the horizon, and also the *reversed* copy of Sir J. Herschel's, and on consideration of the discussion given with the drawings, I do not think that Lieut. Herschel's observations tend to disprove any one of the alterations which I have previously communicated to the Society. The present drawing, and the answers given to the referees, will, I think, render this clear.

The present observations have been made with the same instrument as the former ones, the object in the same position—approximately 80° above the horizon. The measures were taken with a bar micrometer by Cook and Sons, the bars being carefully traced in pencil on the drawing paper, in such a manner as to exactly fill the field of the telescope. All the stars visible were dotted down, the distances from η of the 6th, 7th, and 8th magnitude stars were lettered, measured, and catalogued from a scale of equal parts, after which the micrometer pencil lines were rubbed out, and the nebula inserted.

The first question put by the referees relates to a comparison of the positions of the principal stars and smaller groups as shown in my two drawings, which are said to have a sufficient general agreement with each other, considered as eye drafts, while they are irreconcilable with both Sir John's and Lieut. Herschel's configurations. A simple inspection of my drawing of 1870 with the reversed drawing of Sir John Herschel (*A.A., plate 4, in the Monthly Notices R.A.S.*) will show that the following principal stars hold a relative position considered as eye drafts, but not with the Cape Monograph as expressed in the letter, D.D., C.C., (β), (κ), B.C., (E.), 522, 558, 640, 337, 383, 415, (γ), (λ), &c., &c. There are many other stars in my copy of 1870 that are not laid down in plate 4, pricked off from Lieutenant Herschel's drawing.

The other question of note refers to my "having placed within 11½ (on the scale of my drawing of (η) five stars of magnitude at least equal to η, that is, the 7th magnitude, while in Sir J. Herschel's monograph only one star of that magnitude (marked C.) occurs within that distance;" and continues, "can you give any elucidation of the cause of the discrepancy?" also "if you would furnish some instrumental determination of the difference of R.A., and P.D., between η and other stars of equal magnitudes."

In my acknowledgment of this letter to Mr. William Huggins, F.R.S., &c., I mentioned that it was not my intention or desire to dispute either Sir John's or Lieutenant Herschel's configurations, but to call the attention of the astronomical world to the altered features of both the star and the nebula, with a view of obtaining a solution of the changes seen in this most remarkable object. I further stated that the above question was of a physical nature, and could only be answered as such.

On reference to my former papers it will be seen that mention is made, more than once, of the fact that the increase of stars of the same magnitude as η render it difficult to know that star from others, but by its position, and a marked difference in the *light*. The present drawing will show a still greater and more remarkable number of stars of a similar magnitude.

It is to this cause I have so frequently referred the increase of light, which I think is now clearly confirmed by a comparison of Lieutenant Herschel's description with that of Sir John. At one of the monthly meetings of the Society, Sir John Herschel considered the increase of light in the object, as recorded, very strange, and remarked "when I was at the Cape the nebula could not be seen at all with the naked eye." Lieutenant Herschel, when at Bangalore, compared the increased light, when the object was only 15 ° above the horizon, to that of Pleiades in Taurus.

Mr. Le Sueur, in his report on the Melbourne reflector, says "the nebula around η Argus has changed largely in shape since Sir J. Herschel was at the Cape. The star shines with the light of burning hydrogen," and in his opinion "has consumed the nebula."

At the monthly meeting of the Royal Society of Victoria, held on the 13th March, 1871, Mr. Fairie McGeorge, who has now charge of the reflecting telescope at the Melbourne Observatory, read a paper in which he referred to some observations made with that instrument on the star η Argus, and the nebula; and stated "that the object had evidently undergone great changes since Mr. Le Sueur made his sketches of it. It was now beyond a doubt that enormous physical changes were still taking place."

The catalogue accompanying my present drawing, made for the referees, and laid on the table, will show that there are now in the same field two stars of the 6th, two 6½, three 7th, four 7½, four 8th, and nine of the 8½ magnitude, and it is literally crowded with others of from the 8½ to the 12th magnitude. Those lying outside the field and occupying an area of about 1½ °, have their magnitudes attached. The small cluster I take to be Sir. J. Herschel's 3276, described as "a fine, bright, rich, not very large cluster," if so it is now a beautiful cluster of richly coloured stars, quite equal to κ Crucis.

It is almost impossible to define the boundary of the nebula, as it appears to be gradually fading away, and is not so distinct in outline as formerly.

The finest nights have always been selected for observing, and no delineation of the object has ever been given, but what was an accurate representation of its appearance through the telescope.

The following is an extract from a letter addressed by Mr. Severn, of Melbourne, to the Astronomer Royal, and printed in the Monthly Notices, Royal Astronomical Society, for April, 1870:—"I may say that I cannot confirm the new position given to η Argus in respect to the nebula. I have watched it for 14 years, and it is just where it was; of course much less brilliant."

A letter dated 21st June in the same year, which I received from Mr. Severn contains the following passage:—"My present motive is to draw your attention to the injustice *done* you in the η Argus business; I have of course read all your letters in the Monthly Notices of the R.A.S. on the subject. *You must* not allow the *Spectator*, or Mr. Le Sueur, or any other man to deprive *you* of your discovery; *you* have at least done, and *that* years ago, what the 4ft. Cassegranians and Mr. Le Sueur *are* claiming as their discovery. *I can't* stand this, and therefore if you don't defend yourself, by writing to our papers, *I must*. I send you a *Leader* with my paper in it, also another *re η*."

On reading these two extracts, which are dated about the same time, it will appear that the writer must have very suddenly changed his mind.

In June, 1869, I visited Melbourne for the purpose of seeing the new large reflecting telescope, and must confess to being much surprised on seeing the object η Argus in such a small field with so large an instrument. Mr. Le Sueur thought at the time that he saw a faint shadow of a lemniscate; and what I saw was a dark path across the nebula, not unlike that portion of Eridanus, occupied by 188 and 198 l. C. and not far from the star Achernar. The object was only seen between passing clouds, and although the best speculum was in the instrument at the time the definition was not good.

In June, 1862, I brought before this Society a copy of the drawing made from observations on that beautiful cluster of coloured stars known as κ Crucis, the original drawing, &c., of which was at the time remitted to the Royal Astronomical Society, with notes on the variation of both colour and position when compared as eye draft, with Sir John Herschel's observations made at the Cape of Good Hope. *(Vide Monthly Notices, R.A.S., Vol.* 23, *p.* 32.*)*

As the instrument used at the Cape was in every respect different from the one used in Hobart Town, and the effect of colour varying, as it does, so much in different persons, I discontinued observing to allow time for other changes to become known, and have now waited nearly nine years, in order to compare the object with the previous drawing by the same optical means. Sir John Herschel estimated this cluster to be formed of from 50 to 100 stars; in the drawing of 1862, a copy of which now lies on the table, there were laid down 75 stars to which the colour of each was given. It is now known that certain alterations have taken place since 1862, but a series of cloudy nights has prevented the possibility of preparing a sequent to the former drawing in time for the present meeting.

ROYAL SOCIETY.

JUNE, 1871.

The monthly evening meeting of the Society was held on Tuesday, 13th June, Justin McC. Browne, Esq., in the chair.

William A. Kermode, Esq., of Mona Vale, who had previously been nominated by the Council, was after a ballot declared duly elected a Fellow of the Society.

The SECRETARY laid on the table the following returns for the month of May:—

1. Visitors to Museum, 775.
2. Ditto to Gardens, 2315.
3. Plants received at Gardens:—From Dr. Schomburgh, Director of Botanic Gardens, Adelaide, 29 Plants. From J. Miller, Esq., Mayor of Port Elizabeth, Cape, per J. W. Graves, Esq., a collection of Bulbs from South Africa.
4. Plants sent from Gardens. To M. J. Linden, Brussels, 5 large Fern Trees.
5. Tench supplied. To Rev. Canon Sharpe, 24 Tench, for Bathurst, N. S. Wales.
6. Times of leafing, flowering, &c., of a few standard plants in Botanic Gardens.
7. Books and Periodicals received.
8. Presentations to Museum.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., Table, &c., May.
2. Westbury, from F. Belstead, Esq., Ditto.
3. Swansea, from Dr. Story, Ditto for April.
4. Melbourne, from R. L. J. Ellery, Esq., Notes for April.
5. Sydney, from H. C. Russell, Esq., B. A., Printed tables for March.

The SECRETARY read the following:—

The presentations to the Museum and Library were as follow:—

1. From Master F. G. Bailey—A few very beautiful Butterflies from Ceylon; a purse made by natives of Ceylon, the material of which the article is manufactured being paper prepared in such a manner as to be readily mistaken for leather.
2. From Mr. Alexander Reid, Ratho—An albino variety of the common Quail.
3. From Mr. Blacklow, Brighton—A wedgetailed Eagle *(Aquila fucosa)*.
4. From Dr. Huston—A Paradise Duck.
5. From Sir R. Officer—A Rail *(Rallus pectoralis)* from New Norfolk.
6. From Mr. F. S. Edgar—The shell of a large Turtle.
7. From Master C. Allport, four copper coins and tokens.
8. From Captain Gourlay, two very fine specimens of shells of the Pearl Oyster, measuring 9½ inches in length, by 8½ inches in width.

[In a note which accompanied this presentation Captain Gourlay stated that the shells were, he believed, brought from the Solomon Island Group, in the Pacific. A cargo of 70 tons of these shells was sold in Sydney about three months ago, and fetched about £150 per ton; the pearl being considered superior to any previously taken to that port.]

9. From Mr. J. W. Graves, a photographic copy of the deed of conveyance of Franklin Island, by Lady Franklin, in favour of the Tasmanian Acclimatisation Society.

10. **From the author, Mr. M. Allport, a short History of the introduction of the Salmonidæ to Tasmania, being a paper read before the Zoological Society of London.**
11. **From Mr. Justin Browne, Journals of House of Commons, 1644.**

Mr. BROWNE remarked that he presented these papers both because they were, he thought, new to the colony, and had reference to a period of great historical interest. Mention is made of Lieutenant-General Cromwell, Lord Fairfax, and other characters. The original resolutions as to the supply of armour, arms, and ammunition to the army, raising of troops and loan money may be noticed, with many other matters of interest to the student of the history of the day.

Mr. DAVIES fully agreed with Mr. Browne in thinking these parliamentary papers possessed very great interest, and thought the Society was much indebted for a presentation of such value. He took this opportunity also of proposing that the photograph of the deed of gift from Lady Franklin (Presentation No. 9) should be framed and hung up in the Museum as a memento of a lady who had done so much in the interest of the Society, both during her residence amongst us, and long subsequent to her departure.

Mr. GOULD cordially seconded. He thought we could not do too much to indicate our appreciation of such a friend as Lady Franklin had always shown herself to be to the cause of science in Tasmania.

The motion was unanimously agreed to.

A paper by Mr. F. ABBOTT, Superintendent of the Society's Gardens, on the Sugar Beet lately grown by him was read. Discussion ensued when it was suggested that Mr. Abbott might further extend the notice of the root by making observations on its cultivation, value of crop, its immunity or otherwise from the attacks of insects which are so fatal to the Turnip, or Brassica tribe.

Mr. ABBOTT undertook to do so, and Mr. Davies promised to give the paper as much publicity as possible in *The Mercury*.

It will be recollected that information on this subject has already been laid before the Society by Mr. Barnard and Mr. J. Walker. By the former in reference chiefly to the extraction of sugar by private individuals, and in an inexpensive manner in New South Wales; by the latter as to the mode of extracting alcohol and sugar on a large scale in extensive manufactories in England and on the Continent. (See Monthly Notices for June and August, 1869, and July, 1870.)

The SECRETARY read the following communication on the growth and preparation of cork-wood (for which the Society is indebted to Mr. Justin Browne) from Mr. W. H. Reynolds, of Otago, who had been formerly extensively engaged at home in the cork trade :—

"The Cork Tree is grown chiefly in the provinces of Catalonia, Estremadura, and Andalusia in Spain; in Alemtejo, Estremadura, and Beira in Portugal; in the south of France, the island of Sicily, and Algeria in Africa. The tree is naturally of slow growth, but grows faster in rich and sandy, than in rocky soils; the best cork, however, is procured from trees grown in the latter. When from 12 to 18 feet high, the trunk, including the cork, generally measures about one foot diameter. At about this stage the tree may be stripped of the cork. The first strip is useless as an article of trade, and can only be utilised as a material for the floats of fishing nets. Cork may be stripped without detriment to the tree, and the proper time for the operation in Europe is between the end of April and the beginning of October. The tree possesses a bark under the cork, and care must be taken in stripping not to take off or materially injure this under bark. The only tool used in stripping is an American axe having a straight handle of the ordinary thickness, the end of which requires to be cut to the shape of a wedge. A ring is cut with the axe round the foot and top of the trunk of the tree, and then straight lines are cut along the whole trunk at a distance from each other of about two feet, so as to connect the two rings ; this done the wedge is inserted in the straight line towards either the top or the bottom ring, and the cork-wood is gently pressed off. In the case of a small tree, say, of one foot diameter, with much care it will come off in one piece.

"The tree also produces cork on its branches, which may be stripped in the same way whenever they (the branches) reach one foot in diameter. After the tree is stripped nothing is to be done to it. When the cork-wood is taken off the under bark is of the colour of the human skin, but gradually gets darker until it becomes the colour of chocolate, and sometimes of dark lead. No sooner is the tree stripped of the cork-wood than it again puts forth its functions to acquire a new inner bark and form a new covering of cork. The cork *(Epiphlœum)* is formed between this new and the old bark, and takes from six to ten years before it is ready again for stripping, that is, until it reaches the thickness of about an inch. By examining the head of a common wine cork, lines are distinctly visible, between each of these lines indicates one year's growth. The older the trees are the better the cork gets ; being of slower growth it is less spongy, and firmer in texture than that procured from young trees.

"The Cork Tree grows to a large size, and like the English oak is a long liver. Cases have been known where one tree, including its branches, has yielded nearly half a ton of cork-wood.

"In Spain and Portugal the cork forests have been planted. The acorns, so soon as they drop from the trees, begin to sprout ; they should be put in the ground as soon as they fall. The young trees do not like transplanting.

"After the second and following crops of cork-wood are stripped from the trees the sheets or planks of cork ought to be laid on the ground for about a week or so, bark upwards, as if the inside is exposed to a hot sun for the first few days after stripped it is likely to curl and crack when straightened. Up to some 40 years ago all cork-wood was subjected to fire within a week or two after stripping. The object of this was to burn off the outer bark *(Epidermis)* and soften the texture, but of late years it has been submitted to a steaming process which softens the cork and improves the texture. The bark is then scraped off with a tool almost similar to a three-cornered ship's scraper ; this done, the cork is faced, sorted into different qualities, and packed in bundles ; it is then ready for the market. The firm of Thomas Reynolds and Sons, in their several manufactories in Spain and Portugal, during the height of the season, had occasionally in their employ between 1200 and 1500 hands.

"The value of cork-wood varies very considerably, ranging from about £8 to £150 per ton. The best description is obtained chiefly from the forests in Spain and the south of France. That obtained from Portugal is of quicker growth, and consequently more spongy. The quantity obtained from Sicily and Africa some 21 years ago was very trifling ; the quality, however, was good. Of late years the duty on made corks has been taken off in England, consequently, large manufactories have been established in France, Spain, and Portugal for supplying England with the corks instead of the cork-wood."

On discussion several members expressed a doubt if a tree which required a growth of 25 to 30 years before becoming useful could or would be planted with a view to profit. On the other hand, it is to be recollected that after the first returns are obtained the process of stripping may be continued every eight or ten years for several centuries, and that the quality of the bark, instead of becoming deteriorated, improves according to the age of the tree.

Mr. Justin **Browne** read, as supplementary to some former publications by the Society on silk culture, the following remarks on the management of the mulberry tree in China and Japan :—" In China mulberry trees grow on the hills in places unsuitable for ordinary agricultural purposes. A temperate and cool climate produces the best silks. The *Morus alba* contains in the greatest proportion both the nutritive and silk forming substances. The *Morus multicaulis* produces in greater abundance a large leaf, which may be given to the worms in their earlier stages, but, being watery, is not so nourishing as the smaller leaf of the *Morus alba,* which has more resinous or silk-forming quality. Mulberry trees grown in temperate or comparatively cold climates produce more substantial leaves than those grown in tropical countries. A soil of humid gravel and sand is best. The tree if planted in rows should be two yards distant, and the rows four or five yards apart. Stripping should be deferred till the tree is three years old ; it may then be thinned and pruned to the extent of four-fifths of the leaves. Avoid tearing off needlessly leaves and young branches, which bleed the tree. A young tree will yield five or six pounds of leaves ; in eight or ten years from thirty to forty pounds per tree. The value of young leaves is 4s. per cwt., and in their prime 10s. per cwt. In Japan mulberry trees are planted along the borders of the fields, sometimes in rows across them at such intervals from each other as not to interfere with the other crops. In one district large fields are planted on ridges in lines at a distance of over 2 feet from each other, the ridges being more than 3 feet apart ; as a rule the tree is kept in a dwarf state, the stumps being only 10 to 18 inches above ground. Sometimes they are allowed to attain a height of 4 or 5 feet, especially when grown in the middle of a field, the few full-grown trees seen were in the vicinity of dwellings. The Japanese state that dwarf trees produce leaves softer and better adapted for feeding silk worms, they say also that trees raised from suckers or layers are preferred, because they yield large leaves and a small quantity of fruit, while trees raised from seed yield plenty of fruit and small leaves. The Japanese manure their trees several times in each year, and use manure prepared from a liquor from the rice plants."

The usual votes of thanks to the authors of papers, and the donors of presentations having been passed, the meeting terminated.

JULY, 1871.

The monthly evening meeting of the Society was held at the Museum on Tuesday, the 11th July, M. Allport, Esq., Vice President, in the chair.

Mr. F. G. Salier, who had been previously put in nomination, was after a ballot declared duly elected as a Fellow of the Society.

The following returns for the month of June were laid before the meeting :—

1. Visitors to Museum, 805.
2. Ditto to Gardens, 1652.
3. Plants and seeds received at Gardens :—

A. From Melbourne Botanic Gardens, 33 plants, chiefly of economic value.

B. From Dr. Hooker, Royal Gardens, Kew, 88 packets Asiatic, 177 ditto American, and 234 ditto of European seeds, in all 499 varieties.

4. Books and periodicals received.
5. Presentations to Museum.

Meteorological Returns :—

1. Hobart Town, from F. Abbott, Esq., table and summary for June.
2. Port Arthur, from A. H. Boyd, Esq., table for May.
3. Sydney, from the Government Observer, table for April.
4. The Secretary read the "Notes on the Meteorology and Mortality of the Hobart Town Registration District during the month of June, 1871," by Dr. E. Swarbreck Hall.

The presentations to the Museum were as follow :—

1. From Mr. T. A. Shone, Back River, a curious horny growth from the haunch of a sheep.
2. From Mr. G. Dinham, a crown-piece of the "Gun Money" of James II., 1690 ; struck during the war in Ireland.

[This coin is one of those originally struck as half-crowns, but metal becoming scarce they were afterwards called in and re-struck as crowns. The first impression is still partly legible on the coin now presented. Information on the subject was read by the Secretary from "Ruding's Coinage of Great Britain," vol. 2, page 27.]

3. From Mr. B. Webb, a bronze coin, a copper do., (Guernsey 1834.)
4. From Mrs. J. Allport, a collection of Ferns from Madras.
5. From Mr. H. Gomolka, an extensive and valuable collection of New Zealand Birds (80) Fishes (13), Crustaceans (27), Shells (36), European Mammals (5), Birds (12) ; and South Australian Birds (7), Shells (33.) These specimens were all collected, prepared, and mounted by the donor.

The following remarks "On a new Genus of Freshwater Mollusks," by Mr. W. Legrand, were read by Mr. Allport :—

"Some time since Mr. Maddock, of Dunrobin, sent some freshwater shells to the Museum. One of them at the time struck me as being new ; to be certain of the matter I sent specimens to Mr. Hanley, of London, that gentleman's answer is as follows :—'One of your fresh water species is quite a novelty, it is even of generic importance. It is almost a *Gundlachia*, but merits distinction. I propose for it the name of *Legrand a* in honour of the discoverer.'

"The shell mentioned in some respectsre sembles an *ancylus*, the finest specimens that I have seen are those from Dunrobin, I have also received some of a smaller size from between New Norfolk and Hamilton. I propose for it the specific name *Maddocki*. A description with figures will appear in my monograph of Tasmanian freshwater shells now in course of preparation."

An elaborate and interesting paper on "Sheep-Breeding" was read by Mr. S. Smith Travers. Conversational discussion, in which several of the Fellows took part, ensued. Some of the points referred to in the paper, however, required much time for consideration, the tabular details could not at once be followed, and no very definite expression of opinion was therefore to be expected, It is probable another opportunity will be taken for re-opening the discussion.

It was agreed that the paper should be published in the proceedings of the Society, the subject being one of general interest. A vote of thanks was given to the author, and to the donors of presentations.

The SECRETARY begged to call the special attention of the Fellows to the presentation by Mr. Gomolka. It was needless for him to say anything as to the value of such an acquisition to the Museum, and he would therefore propose that a special vote of thanks should be accorded to the donor. This was cordially and unanimously agreed to, and the meeting terminated.

AUGUST, 1871.

The monthly evening meeting was held on Tuesday, the 8th August, Morton Allport, Esq., in the chair.

The following gentlemen, who had been previously nominated by the Council, were after a ballot declared duly elected as Fellows of the Society :—The Rev. Brooke Bailey, A. Riddock, Esq., and John A. Jackson, Esq.

The following returns were laid before the meeting :—

1. Visitors to Museum during July, 809.
2. Ditto to Gardens during July, 1,662.
3. Seeds received at Gardens—From Royal Gardens 499 packets of shrub and three seeds (referred to at last meeting), 300 of which are of species not yet under cultivation at the Gardens. Of the balance about 100 varieties will be valuable for exchange.
4. Plants supplied for planting public places.
    (*a.*) For Bothwell Church grounds 100 plants.
    (*b.*) For Catholic Cathedral grounds, Harrington-street, 192 ditto.
    (*c.*) For New Norfolk Asylum grounds 61 ditto.
    (*d.*) For Longford Church grounds 80 ditto.
    (*e.*) For Cascade Asylum grounds 140 ditto.
5. Time of leafing, &c., of a few standard plants in Botanic Gardens.
6. Books and periodicals received.
7. Presentations to Museum and library.

Meteorological Returns.

1. Hobart Town—From F. Abbott, Esq., table and summary for July.
2. Port Arthur—From A. H. Boyd, Esq., table for June.
3. Westbury—From C. Belstead, Esq., ditto.
4. Swansea—From Dr. Story, ditto.
5. Melbourne—From R. J. L. Ellery, Esq., notes for June.
6. Sydney—From H. C. Russell, Esq., printed tables for May, and "Results of observations for 1870."
7. Queensland—From the Rev. R. D. Harris, report of meteorological observations for 1869.
8. The SECRETARY read the "Notes on the Meteorology and Mortality in the Hobart Town Registration District during the month of July, 1871," by Dr. E. Swarbreck Hall.

The presentations were as follow :—

1. From Mr. J. Kelly, 2 Chinese coins, and 1 Persian ditto.
2. From Mr. Schofield, shells from Wreck Reef.
3. From Mr. W. Josephs, Clarence Plains, a curious fish washed on shore in that locality.

[This fish bears considerable superficial resemblance to the *Chætodons* (beautiful tropical fish). They seem extremely rare in Tasmania, and Mr. Allport stated that he had seen but one other specimen, which was procured on the North Coast by Mr. J. L. Smith, and is now in the Museum.]

4. A Whip Snake (*Hoplocephalus coronoides*) found alive in a hollow log of firewood.
5. From Mr. H. Gomolka, a mineral specimen from Dun Mountain, New Zealand.
6. From Meteorological Department, Board of Trade, London, Quarterly Weather Report, parts 3 and 4, 1869, and Barometer Manual, 1871.
7. From the author, M. Allport, Esq., F.Z.S., &c., additional notes, in continuation of the history of the introduction of the Salmonidæ into Tasmania, from proceedings of the Zoolological Society of London.

The Secretary remarked that the question as to the best method of destroying rabbits on runs had become one of extreme importance, not only to the sheepowners of the colony, but to the public in general; it was one, too, which lay strictly within the scope of the aims and actions of the Royal Society. He had recently learned that Mr. John Bisdee had been very successful in destroying rabbits which had been particularly numerous on his runs; and he also had been informed by Mr. Maclanachan that he had adopted Mr. Bisdee's method with very excellent results. On communication with Mr. Bisdee on the subject, he (the Secretary) had been favoured with the following observations which he would proceed to read to the meeting. *(See page 46.)*

Discussion ensued, in which Mr. W. Gellibrand, Mr. Justin Browne, Mr. J. Davies, Mr. Webster, Mr. Barnard and others took part. It having been remarked that rabbits could readily be exterminated if all sheepowners acted in concert, it was suggested it might be necessary to obtain a compulsory Act of Parliament for the purpose of securing united action. It was observed, however, that even this would scarcely be effectual, as it could not readily be brought to bear in the case of Crown lands where the rabbits would still continue to breed.

The Secretary intimated that he expected to hear from Mr. Maclanachan on the same subject before next meeting, and he hoped that others also who may have tried experiments in the destruction of rabbits might give him the results of their experience for the purpose of bringing them under the notice of the Society, and thus securing for them due publicity.

Mr. Morton Allport read a paper on the Salmon Trout *(Salmo trutta)* lately sent to England, and a letter, received by last mail, from Dr. Günther on the same subject.

A vote of thanks to the authors of papers, and the donors of presentations, closed the proceedings.

THE SUGAR-BEET.

By F. Abbott, Jun., Superintendent Botanic Gardens.

Read 13th June, 1871.

It may be remembered that in 1869 a plot of ground in the Society's gardens was planted with the Silesian sugar-beet, for the purpose of testing the suitability of the colony for the culture of this plant. The intention at the time was to have endeavoured to manufacture a small quantity of beet sugar, not only with the view of ascertaining the probable percentage obtainable, but also because it was thought it might have the effect of stimulating the industry, if it could be proved that sugar was obtainable in paying quantities.

Owing to various causes, among others the want of proper appliances and funds, to carry the experiment to a successful issue, no attempt was made to extract sugar from the roots at the proper time, I therefore thought it advisable to select the best roots for the production of seed, of which there now is about 10 bushels on hand. It would be very desirable that this seed should be distributed to persons willing to give the root a fair trial; as the season for sowing is now at hand no time should be lost in the distribution.

It may not, perhaps, be generally known that the Silesian beet is much more nutritious as cattle food than the common mangold. According to recent analysis by Dr. Voelcker, 1 ton of sugar-beet is equal to at least 1½ tons of common mangold. The weight of roots produced per acre is generally about 20 tons, but 30 and even 40 may be secured by good cultivation, so that apart from the value of this crop for the production of sugar, it is worthy to be more generally grown for feeding purposes. It enjoys as great an immunity from insect pests as the mangold.

The following remarks bearing on its cultivation may not be without interest to intending planters:—The proper time for sowing the seed in Tasmania is about the middle of August; in the midland districts a little later, say about the beginning of September. It should be dibbled in, a foot or fifteeen inches apart, or it may be sown in prepared beds, and transplanted with as little risk as the mangold. From 10 to 15lbs. of seed will be found sufficient for an acre of ground. The soil must be in good condition, it should have been well worked, and if not in good heart manured in the autumn. Unless the soil is in a finely pulverised state, the roots cannot properly develope themselves. It is essential that the root be well imbedded in the soil; if this is not the case the amount of saccharine matter is greatly diminished, as in both mangolds and sugar-beet the portion above ground contains little else than scouring salts, and would be rejected as worthless by the manufacturer. Analysis proves that the portion farthest removed from the light contains most sugar. Heavy dressings of manure near seed sowing or transplanting time should be avoided. Freshly manured and new land are not favourable for the production of sugar, and, although under such circumstances the roots grow to a large size, the amount of saccharine matter is but small; roots from 1½ to 2½ lbs. weight are found to be richer than those of a larger size.

The after culture is very similiar to that for the common mangold, and consists of thinning the crop and hoeing from time to time, taking the precaution while hoeing to work the soil round the tops of the roots, in order to bury any portion that may chance to be exposed to the light. These are the only operations necessary until the plant is sufficiently ripe for harvesting, which may be known by the leaves having a flabby, yellow appearance, when care should be taken that the plants do not make a second growth, which they will be apt to do should rain fall at this period. Should the autumn be dry the roots may remain longer on the ground than if warm and moist, but they should be harvested before frost sets in; both second growth and frost would greatly diminish the amount of sugar. The leaves should not be stripped from the plants during their growth, because if this be done the light will have free access to the tops of the roots, causing them to turn green, and diminishing the saccharine matter.

Should the weather be fine and dry when the crop is taken, it is a good practice to allow the roots to remain on the ground for a day or two, covering them with leaves to shelter them from the direct rays of the sun; by thus exposing them, they part with a portion of their moisture, and are in better condition for stacking. When carted from the field the roots should be stacked in ridges, covering them but slightly at first, in order that more moisture may pass off and heating be prevented. So soon as all danger of heating has passed, the heaps may be sufficiently covered with soil to exclude frost; beating it well down that rain may also be thrown off.

There can be little doubt but that the climate of Tasmania is admirably suited to the requirements of this plant. With an autumn sufficiently long and dry to thoroughly mature the roots, the quantity of saccharine matter should be great. In England and on the Continent this varies greatly, in some cases being only 3 and in others as much as 15 per cent.; the average appears to be from 10 to 12 per cent.; 8 per cent. can be profitably manufactured into sugar, but all over this materially increases the profits of the manufacturer.

The most essential point for us to ascertain at present, is the precentage actually yielded by roots grown in different parts of Tasmania under different conditions. This most desirable information once obtained, would be the key to all future success in the cultivation of sugar beet in the island, whether for the production of spirits, sugar, or for feeding stock only.

The profits arising from the manufacture of spirit and sugar, both in England and on the Continent, depend greatly upon the amount invested; the greater the amount invested in the industry, the greater the profit. From 15 to 30 per cent. is said to be realised from the manufacture of sugar; the profits arising from distillation are said to be much greater; according to recent continental returns from 30 to 60 per cent. of clear profit is said to be netted.

At Lavenham, Mr. Duncan realised last year a profit of 15 per cent. on the manufacture of beet-sugar, although he could not obtain sufficient roots to keep his machinery in full work; in addition to which he had to pay a duty of 8s. per cwt., chargeable on English made sugar.

The object in penning the above lines being to draw the attention of agriculturists to the importance of sugar beet culture, sufficient has, I trust, been said to that end. I would only add, that the more the root becomes cultivated the greater the probability of manufactories being started in the colony. It is not to be expected that capitalists will embark in such an undertaking until the raw material is forthcoming to warrant the importation and employment of skilled labour and machinery.

SHEEP-BREEDING.

By S. Smith Travers.

Read 11th July, 1871.

In the remarks on sheep-breeding which I am about to submit to you, I must beg you to understand that I do not profess to be able to offer you the results of any experiments of my own, nor any theory founded on the experiments of others.

I cannot find, indeed, that any experiments have ever been made upon any scientific principle, and upon such a scale as to arrive at any defined and certain laws, such as must underlie and govern the science of artificial selection, whilst on reference to those authorities who have written on the subject, I find discordancies of opinion, coupled with vagueness of technical phraseology, that must leave every one in doubt as to whether indeed we do know *scientifically* more of breeding now than we did one hundred years ago.

And if what we do know be not scientifically known, and proved and arranged, I must contend that it is not really known, and does not really belong to us. It is true that owing to the attention of a very great number of highly educated men to the subject, the most extraordinary improvements in our various breeds of sheep and cattle have been effected. But if these distinguished breeders were to be taken away, where should we find, or be able to lay down any of the principles on which they have proceeded? It is very well to point to Mr. Bakewell, who in the middle of last century originated the Dishley Leicesters, and to the MacArthurs, Learmonths, Coxes, Mr. Bailey, and others to whom we owe our Australian breeds; but the question is what are the principles of selection on which they have proceeded? Had they any?

The reply, I suspect, would be that the principle, the only principle governing their selection, was to choose the finest ram, and put it to the finest ewe or ewes, according to the individual judgment. If we could ascertain the truth, we should find that these celebrated breeders depended entirely on their natural gifts of hand and eye, and upon some intuitive sense of harmony, symmetry, and perfection which has enabled them to choose and artificially select, till in a certain number of years, the same eye and hand and intelligence always presiding at the drafting yard, they have culminated in certain flocks of surpassing excellence. The question therefore remains—have these breeders, either in England or Australia, anything in common in their plan of action? Can we ascertain if, apart from their individual genius and aims, they obey or seem to obey one common law?

The English sheep-breeder—from reasons easy to comprehend, aims at carcase rather than wool—the Australian at wool rather than carcase. In these different objects do we find them both adhering to one practice. Is the path by which each seeks to obtain perfection but a different bye-way of the one high road?

I believe the answer to be that all intelligent breeders pursue and have pursued one common route, though their paths may differ. They all breed, or try to breed, in-and-in.

Their aim may be for carcase or for wool; and again, amongst wool-breeders for combing or for clothing wools. But all experience shows that speciality and excellence in any one quality is to be obtained only by breeding in-and-in; by breeding like with like. And though not a part of my subject, I may remark parenthetically, that with cattle and horses the same general law is accepted.

This point, the necessity of in-and-in breeding, I am compelled to assume; it would take me too long to bring before you evidence in support of what I assert, and I doubt if it be necessary.

But it is curious and illustrative of our scientific ignorance of breeding, that whilst every celebrated horse, or bull, or cow, or sheep, is invariably the result of in-and-in breeding, the wide and fixed popular prejudice is against it, and is in favour of cross-breeding. And whilst every farmer or squatter, if he wish to improve his breed, will give an extravagant price for an animal, which is the triumphant proof of what in-and-in breeding in certain hands can achieve, yet as a rule, you will find he declines to breed in-and-in himself, generally alleging that he has tried it and that it does not pay.

At present what is the practice, or what is I believe the practice? It is to confine on one station so many thousand sheep of both sexes. If not to breed together absolutely hugger-mugger fashion, yet subject to the selection of the drafter, who culls and rejects all inferior specimens, to let the rest breed together, fathers, mothers, sons, and daughters promiscuously, and regardless of all shades of affinity.

But I argue that this is illogical. If affinity considered in the gross has worked such wonders—if the mere shutting out all foreign strains of blood has done so much for breeding—what might not be effected if the principle were carried out, and applied in the minor shades scientifically?

Might not this law, if applied *scientifically*, save the expense and time wasted and lost in breeding the animals, which after all have to be culled and sent to the butcher? Not that the breeder's judgment and experience would be less wanted, but his time, the time of the station, now wasted in breeding useless varieties, might be saved, and instead of its taking thirty years to bring a flock or a brand to perfection it might be that ten years or less would suffice.

My object therefore is to examine, if I can, this said system of in-and-in breeding, this breeding like with like, and by symbolising the relations that arise amongst sheep on those stations, where in-and-in breeding is observed, I hope to suggest a method by which to classify and arrange the various degrees of affinity into groups, as a preparatory step towards those experiments, which will I believe, if made by competent persons, and on a sufficient scale, enable us to lay down and define the laws governing the art of selection.

I know that my method is crude and deficient in many respects, wanting in the accuracy so necessary to scientific research. I regard it entirely as the suggestion of an unscientific person to men more capable, who may be able to discern the truth, if there be any in it, and who in that case may give precision to the symbolisation I propose to use.

My proposal is to regard the organisation of the individual, its race, its blood, or whatever is understood by these generalisations, as a quantitative quality, and to treat it quantitatively.

Thus if I call the ram A, and the ewe B, I term the product of their union AB for the male issue, and BA for the female. If I marry A the father with BA the daughter, I call their issue A^2 B if a ram lamb, and BA^2 if a ewe lamb. If, again, I marry AB the son with his mother, I call the progeny AB^2 if male, and B^2A if female. If I marry AB the son with BA the daughter, I call the issue $A^2 B^2$ if male, $B^2 A^2$ if female.

By this method I hope to make the changes in the shades of affinity apparent and tangible.

In the sketches of pedigrees appended to the paper, and which I now lay before you, I assume that the ewes produce 100 per cent., and an equal proportion of sexes. This for convenience.

Pedigrees No. 1 and No. 4 show the breeding of a ram with his daughters, grand, and great granddaughters, and if we examine the practice of every station where in-and-in prevails, it will be found that the results of this plan of breeding, and the strain it produces, must be the prevailing strain, and the action in that direction progressively increasing in force.

It is true that the stud rams are each year recruited with a small accession from their sons. But the number of sons breeding with mothers, or of brothers with sisters, is small compared to the regular and extensive majority of sires breeding each season with their female progeny.

In pedigree No. 2 you will see the effect of four generations breeding back to the mother's race. But to be a tolerably perfect experiment you will remark that in this case it is necessary that the 50 ewes or 50 B shall be whole sisters. In breeding back to the father's line, from the power the male possesses of impregnating numbers, the relationship of his ewes, one to the other, does not signify to the same extent. Indeed, unless quite certain that they are of the highest strain, it is better when starting a station that they should not be whole sisters. For if not of the highest known strain the breeder would lose the superior chance offered by putting 50 ewes of similar but not so closely allied family, the chance of some atavism in some of them being awakened and called out which should hit in with the male and produce some exceptional animals.

To return to pedigree No. 2. If the ewes are not whole sisters the experiment no longer carries out its intention, as you will see by reference to pedigree No. 5, where I letter the different ewes B C D E F. Turning to pedigree No. 4, if B has a male lamb the experiment is only so far perfect that I can breed him with his mother, and there will be 24 other ram lambs to breed back with their mothers. The 25 ewes that produce ewe lambs are out of the experiment, and those ewe lambs go to strengthen pedigree No. 1 and its effects.

I must, you perceive, breed each ewe that has a ram lamb with that son, or I do not breed back to her blood. For, if I take any one ram lamb, say AB, and breed it next generation with all the ewes, they, not being sisters, would merely receive and transmit B's influence, without in the least effecting our purpose. AB with his mother would get, it is true, AB^2 or $B^2 A$, but with the 24 other ewes, who are C D E F G, the result would only be ABC, ABD, ABE, ABF, ABG.

If AB begets from his mother a ram lamb or AB^2 the next generation would be AB^3, $AB^2 D$, $AB^2 E$, etc.

But this is not pure line breeding back to the mother, except with one individual, and at any moment that too is liable to stop, by B's progeny being female.

Again, if all the ewes are sisters, and you each generation breed AB and AB^2 with the original mothers, it is only an approximation, and AB breeds back only with one mother and 49 aunts.

I have gone into this to prove that without extraordinary trouble pure line breeding back to the maternal line is impracticable, unless you begin with whole sisters, and even then it is only an approximation. With old stations, when all the females become more nearly allied, the young rams, when first put in, must be regarded as breeding with their aunts, and producing a sensible effect upon the female progeny.

The effects of breeding brothers with sisters, as in pedigrees 3 and 6, must again presuppose all the ewes to be sisters, for if not sisters, you will find by looking at pedigree 6 that instead of $A^{16}B^{16}$ and $B^{16}A^{16}$ you get $A^{16}B^{4}$ D^{2} FG or its equivalent; results so different from those of pedigree No. 1 that if *that* be the main principle which asserts itself, and if *that* be the beneficial principle of in-and-in breeding, I doubt if this be also beneficial.

In pedigree No. 1 you simplify and intensify. In pedigrees Nos. 3 and 6 you add continually equal increments to each side, and it seems to me strive to intensify the crossing, and not to eliminate a type.

I am, therefore, forced to believe that pedigree No. 1 is the beneficial principle—not because I see that it carries out any theory of my own, but because it is so much the prevailing and progressively prevailing effect that I conclude, if it were bad in principle, no in-and-in breeding on the present loose system would have been possible without deterioration.

If, therefore, I am asked what deductions I draw from the preceding figures, I would say that I am a believer in the indestructibility of type or organisation, but that I do not believe those original types to have been inferior but superior to the highest specimens now extant. I do not believe the original Dishley Leicester sheep to have been an awkward, ungainly, ugly wretch, with no good qualities of any kind. Mr. Bakewell, doubtless, found such an animal, but I believe that that was not the original type; it was the result of centuries—nay, thousands of years—of mongrelization, of bad impressions and conditions, and of non-observance of the law of in-and-in and like with like.

In every animal, I believe, a certain type resides, the characteristics of which are confused or brought out by the most recent female conjunctions. The male blood I regard as the indestructible organisation, and the impressions of the female, whether for good or evil, more or less temporary. But I do not look on female blood as a thing apart. I regard her only as the recipient, and as the conduct and channel for other male blood. When A marries B we must enquire who was B's father, for it is his blood, and B's father's father's and mother's father's blood that, if it appear, is impressed on A and B's offspring, and as it may be discordant or harmonious with A, will clash or hit, and produce discordant or harmonious results. The ram A in like manner has latent in him the blood not of his mother, but his mother's father. But this, like other maternal influence, is but temporary in its effect, to be succeeded in coming generations by other temporary female impressions, the blood he hands down permanently being his father's father's father's and great-grandfather's blood.

To give the question a human significance, I believe that a man hands down to his sons his father's influence, modified temporarily by his maternal male blood and his wife's male blood—to be modified in their turn by their mother's male blood and their wife's.

In all the pedigrees I have made out I have only treated of one ram with 50 ewes. To examine the subject in the proper manner, by the hypothesis of a number of rams put to a larger number of ewes, would have made it too complicated for my purpose. It suffices to point out that in due course the rams become by the action of pedigree No. 1 brothers and half-brothers, and that though their action is only in a certain number of cases direct, that is to say, that of own great-grandfather to own great-grand-daughter, yet if not direct, it is indirectly so, and that it tends to become that of grand and great-grand-uncle with their grand and great-grand-nieces.

The whole tendency of in-and-in-breeding with sheep, owing to the power of one ram to impregnate 50 females, is more and more to intensify and revert to A's type.

If these are the tendencies of in-and-in-sheep-breeding, cannot the desired object be attained more effectually and quickly than now? I believe it can.

PEDIGREE No. 1,

Or, line-breeding back to Sire.

$$\overbrace{25\,a\,b \qquad\qquad\qquad 25\,b\,a}^{a\,=\,50b}$$

2nd Generation.

$$\overbrace{12\,a^2\,b \qquad\qquad\qquad 12\,b\,a^2}^{a\,=\,25\,b\,a}$$

3rd Generation.

$$\overbrace{6\,a^3\,b \qquad\qquad\qquad 6\,b\,a^3}^{a\,=\,12\,b\,a^2}$$

4th Generation.

$$\overbrace{3\,a^4\,b \qquad\qquad\qquad 3\,b\,a^4}^{a\,=\,6b\,a^3}$$

PEDIGREE No. 3,

Or, Progeny with Progeny.

$$\overbrace{25\,a\,b \qquad\qquad\qquad 25\,b\,a}^{a\,=\,50\,b\ \text{(all whole [sisters).}}$$

2nd Generation.

$$\overbrace{12\,a^2\,b^2 \qquad\qquad\qquad 12\,b^2\,a^2}^{a\,b\,=\,25\,b\,a}$$

3rd Generation.

$$\overbrace{6\,a^4\,b^4 \qquad\qquad\qquad 6\,b^4\,a^4}^{a^2\,b^2\,=\,12\,b^2\,a^2}$$

4th Generation.

$$\overbrace{3\,a^{16}\,b^{16} \qquad\qquad\qquad 3\,b^{16}\,a^{16}}^{a^4\,b^4\,=\,6\,b^4\,a^4}$$

If Pedigree No. 1 be an instance of in-and-in breeding, this is not. And yet these two systems, so utterly opposed in principle, come under the present nomenclature of "in-and-in breeding"!!

PEDIGREE No. 2,

Or, line-breeding back to Maternal line.

$$\overbrace{25\,a\,b \qquad\qquad\qquad 25\,b\,a}^{a\,=\,50\,b\ \text{(all whole [sisters.)}}$$

2nd Generation.

$$\overbrace{25\,a\,b^2 \qquad\qquad\qquad 25\,b^2\,a}^{a\,b\,=\,50\,b}$$

3rd Generation.

$$\overbrace{25\,a\,b^3 \qquad\qquad\qquad 25\,b^3\,a}^{a\,b^2\,=\,50\,b}$$

4th Generation.

$$\overbrace{25\,a\,b^4 \qquad\qquad\qquad 25\,b^4\,a}^{a\,b^3\,=\,50\,b}$$

PEDIGREE No. 4,

Fathers with Daughters.

Or, No. 1 re-stated (the Ewes not being Sisters).

To save trouble, those only are taken who are supposed to have female offspring—except in the last, where $b\,a^3$ has a ram-lamb.

$$\begin{tikzcd} a=b \arrow[d, dash] & a=c \arrow[d, dash] & a=d \arrow[d, dash] & a=e \arrow[d, dash] \\ b\,a & c\,a & d\,a & e\,a \end{tikzcd}$$

2nd Generation.

$$\begin{tikzcd} a=b\,a \arrow[d, dash] & a=c\,a \arrow[d, dash] & a=d\,a \arrow[d, dash] & a=e\,a \arrow[d, dash] \\ b\,a^2 & c\,a^2 & d\,a^2 & e\,a^2 \end{tikzcd}$$

3rd Generation.

$$\begin{tikzcd} a=b\,a^2 \arrow[d, dash] & a=c\,a^2 \arrow[d, dash] & a=d\,a^2 \arrow[d, dash] & a=e\,a^2 \arrow[d, dash] \\ b\,a^3 & c\,a^3 & d\,a^3 & e\,a^3 \end{tikzcd}$$

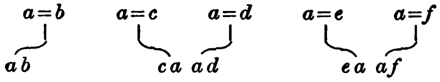
4th Generation.

$$\begin{tikzcd} a=b\,a^3 \arrow[d, dash] & a=c\,a^3 \arrow[d, dash] & a=d\,a^3 \arrow[d, dash] & a=e\,a^3 \arrow[d, dash] \\ a^4\,b & c\,a^4 & d\,a^4 & e\,a^4 \end{tikzcd}$$

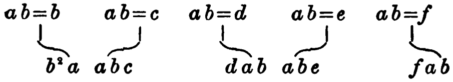
The fact of the ewes not being sisters does not affect the result which is, to breed back to *a* without intermixture.

PEDIGREE No. 5,

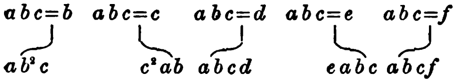
Line-breeding back to Maternal-line (the Ewes not being Sisters); and is No. 2 re-stated.



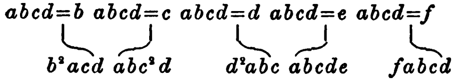
2nd Generation.



3rd Generation.

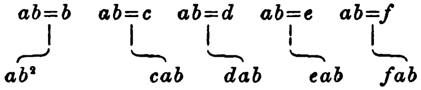


4th Generation.

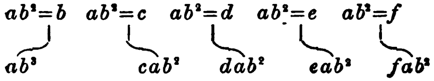


In this scheme is shewn how impossible it seems to intensify the mother's blood, unless all the mothers are whole sisters.—Not being sisters, and assuming that you must each generation take a young ram from a different mother, which virtually must be the case, as you cannot suppose one ewe always to produce ram-lambs, nor, if she did, can you suppose them always fitted for the stud. Suppose, however, this to be the case, and that the ewe *b* had a grandson by her son, and a great-grandson by her grandson, then it would show thus with the other ewes:—

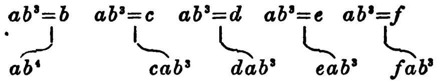
2nd Generation.



3rd Generation.



4th Generation.



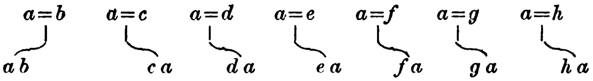
Either all the ewes must be sisters, or you must find a ewe who always breeds ram lambs.

PEDIGREE No. 6,

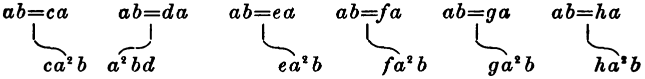
Or No. 3 re-stated.

Or, half-Brothers, half-Sisters and Cousins; the original Ewes not being Sisters.

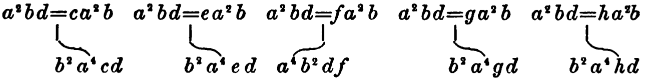
To save figures and trouble, the ewes are supposed to give female lambs,—save and except one in each generation, from which I take the ram to carry on with; his maternity I vary each generation.



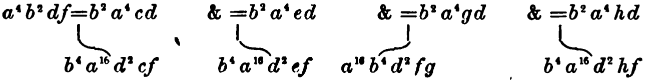
2nd Generation.



3rd Generation.



4th Generation.



THE SALMON TROUT.

By M. Allport, F.Z.S., F.L.S.

Read 8th August, 1871.

Much doubt having been expressed by scientific men in England as to whether young fish have really been reared in this colony from one species of migratory salmon, viz., the salmon trout *(Salmo trutta)*, without allowing the parent fish first to make the usual journey to sea, it was thought advisable to send one of such parent fish (which had twice deposited ova) to England, for the examination of all persons interested in that which will probably prove the most useful discovery in pisciculture yet made.

Accordingly such parent fish was, in March last, sent to the Zoological Society of London, together with two young fish of different ages, the progeny of similar parents.

By last mail Mr. Youl forwarded the following letter from Dr. Günther in reference to these fish :—

British Museum,
13th June, 1871.

Dear Sir,—I have examined the three salmonoids sent by Mr. Morton Allport, and mentioned in his letter directed to you, and dated March 15th.

(1.) The larger specimen is very interesting; it is a female fish, with the ovaries well developed. With regard to the external characters, it agrees perfectly with the migratory sea-trout; it has the dentition and scales, caudal fin, and præoperculum of that species; it shows also ten parr marks, a number met with only in migratory species.

On the other hand, it has only thirty-six pyloric appendages, a number which I have never met with in purely bred migratory salmonidæ, but very commonly found in the river-trout and hybrids between river and sea-trout. (See my Catalogue of Fishes, &c., p. 27.) I think that this specimen does not serve to convince the sceptical that one species of migratory salmon will thrive in fresh water. The coloration of this specimen is altogether peculiar, and I have never seen a fish marked with spots so deeply black, so large, and so numerous as in this specimen. In ordinary sea-trout of the same size the parr marks would have disappeared, but here they are present, and their co-existence with the black spots gives to this specimen quite a peculiar appearance.

I need not give my determination of the species of the two smaller fish, as it appears from Mr. Allport's letter that he is acquainted with the parent fish; but I think it right to state the principal characters, which may lead to a proper determination of these fish.

(2.) The larger, in smolt dress, has eleven series of scales below the adipose fin, 47 pyloric appendages, deeply cleft caudal; parr marks entirely absent.

(3.) The parr has 10 parr marks, 11 series of scales below the adipose fin, 47 pyloric appendages, and deeply cleft caudal.

I remain, &c., &c.,

J. A. Youl, Esq. (Signed) A. GUNTHER.

Before considering this letter, I desire to express my sense of the great obligation the Salmon Commissioners and the colony are under to Dr. Günther for the trouble he has, on several occasions, taken to help us to a correct determination of the species of the various salmonoids sent to England, and to state that, whenever I have arrived at a somewhat different conclusion from so able an ichthyologist, it has been from a conviction that we have much to learn on this important subject, which no experiments yet tried in Europe have been sufficient to elucidate.

First, then, it would appear that in every external feature except colour the large or parent fish coincided absolutely with the description of the salmon trout *(Salmo trutta)*, but that certain peculiarities of colour, and, on dissection, the presence of only 36 pyloric appendages led Dr. Günther to doubt whether this specimen would convince the sceptical that one species of migratory salmon will thrive in fresh water.

But, upon reading Dr. Günther's own details of his examination, can any one doubt that this parent fish was a pure salmon trout? And would it not have been amazing had it proved otherwise, for this fish was hatched, not from an egg laid here, but from one of the English eggs, and, if a hybrid, those who obtained the ova must wilfully and maliciously have played a trick upon all engaged, at great expense, in carrying out the experiment—a conclusion not easily arrived at by those who know Messrs. Youl and Ramsbottom.

As to the peculiarities of colour: variation in colour amongst fish, even where the circumstances are most favourable to healthy development, occurs so frequently that no one should be surprised at the peculiarities displayed by this specimen after its unnatural detention in fresh water. With true salmon *(Salmo salar)*, if smolts are detained in fresh water till the season for migration is past, the parr marks reappear. (See Proc. Zool. Soc., 1868, part 2, p. 247.) Before you is a beautiful specimen exhibiting this peculiarity; it was hatched from one of the English eggs of *Salmo salar*, and died after having put on the smolt scales twice, and twice returned to the parr markings when the period for migration was past. As many present may remember, when the parent fish sent to England was first placed in spirits the parr marks were scarcely visible, but they became more intense afterwards, and, from Dr. Günther's description, must have darkened considerably on the voyage.

On those parent fish which remain in the pond, the parr marks are most apparent immediately after the spawning time, and the fish get gradually more and more silvery till the height of summer.

The deficiency in the number of the pyloric appendages seems far more difficult to account for than the mere variation in colour; yet even in this case may not variation be due to the unnatural detention in fresh water? It is certain that the number of these appendages varies greatly in individuals belonging to the same species. Dr. Günther gives 36 as the normal number for the river-trout *(Salmo fario)*, yet I have found more than 40 in several specimens undoubtedly belonging to the latter species.

One of the parent salmon trout from our pond, a male, which died nearly a year before that sent to England, and which is now in the Museum, was dissected in my presence by our curator, Mr. Roblin, who carefully counted the pyloric appendages, and found 47. With these facts before us, we should not place too much reliance on the number of the pyloric appendages as a specific test. Such facts only show the difficulty of what Dr. Günther, in his preface to the Catalogue of the Fishes in the British Museum, vol. 6, 1866, calls "finding a way through this vast labyrinth of variation of character in the salmonidæ."

Dr. Günther speaks of having found 36 pyloric appendages in hybrids between river and sea-trout; but where were such hybrids obtained, and how was the fact of their being such hybrids authenticated? To obtain a hybrid between these fish, at the same stage of growth as the parent fish sent hence, the ova and milt must have been obtained, the fish hatched and carefully attended to for four years by competent persons. Has this ever been done?

After all, the fact that the parent fish, in every minute external detail of measurement, corresponded exactly with the true salmon trout, and differed totally from the true river-trout, while in colour it resembled neither, proves that it was no hybrid beween those fish; and the circumstance of its having the same number of pyloric appendages as such hybrids therefore matters little.

With regard to the two smaller fish examined by Dr. Günther, his written descriptions correspond with those of the young of true salmon *(Salmo salar)*. Yet these were bred from eggs deposited by fish which never went to sea, and which externally [are identical with the large parent fish sent to England; and I am, therefore, driven to the conclusion that, at this early period of their growth, the migratory species of salmon cannot, with any degree of certainty, be distinguished from one another.

RABBITS.

The following paper on the rabbit nuisance, sent to the secretary by Mr. John Bisdee, of Hutton Park, was read at the August meeting of the Society:—

The destruction of rabbits is now, I believe, generally admitted to have become absolutely necessary, and from my own experience I have no hesitation in saying that had not some means been found of destroying them, one more year—increasing at the rate they have been—would have ruined every agricultural farm near where rabbits were numerous, and stock of all kinds must have starved. I have therefore much pleasure in giving any information that will assist fellow-sufferers in getting rid of one of the worst evils the landholder ever had to contend with.

I may first of all state that I have given my plan to several who have applied to me, and have been surprised to hear that on trial they cannot get the rabbits to take grain, and that when they do appear to have eaten it, it has not killed. My opinion is that rabbits will always take grain, and that if they do not, it is the fault of the person who mixes it—at all events I have never found them refuse it poisoned with strychnine except once, when the strychnine was dissolved in a copper I had mixed lime and sulphur in, and a coating of the sulphur had remained on the sides. To the second objection, that if they do eat the grain that it does not kill, this may arise from many causes, and I can assure anyone who has to contend with rabbits, that he must not expect to be·able to destroy them without many difficulties and disappointments that his own brains must help him to get over. If I were to describe all the experiments I have had to make with strychnine, arsenic, and other poisons, as well as other ways to destroy these vermin, I should fill more paper than you would care about reading. But that rabbits can be destroyed I think would be evident to anyone who had seen them on parts of this estate in May last, and who would take the trouble to ride over it now. The expense of strychnine is, no doubt, a drawback, but until some way of getting them to take a cheaper poison is found, there is no alternative. I have killed numbers with arsenic, but should never have cleared parts of this property as I have done if I had not gone back to strychnine, and I believe that if properly dried the skins will pay for the strychnine.

I commenced by dissolving 1oz. strychnine in 1½ gallons boiling water, with five teaspoonsful of muriatic acid; with this solution I pickled four bushels of wheat crushed. This killed a great many, but not so many as I thought it ought. I then reduced the quantity of grain to three bushels, and changed from wheat to oats, but still did not pick up the numbers I expected. At that time I was using two different brands of strychnine, and found a very great difference in the numbers killed according to which sort I employed; so great was the difference that it took 2oz. of one brand to kill as many as 1oz. of the other, and I have no doubt one was a mixture of some sort. The brand to depend upon is "Jacop Hulle," and with the mixture I give below, carefully prepared, any number of rabbits can be killed. I have tried several experiments with this, and have dissolved 1oz. to one bushel, and yet did not pick up any more rabbits on the spot, they still travelled some distance, I think the faculty will be able to explain this; but I find that I get quite as many rabbits with 1oz. to two bushels, and have therefore lately kept to that quantity. Many have asked me whether it can be placed with safety on runs where sheep are running, and as I have heard it reported I had killed upwards of 500 sheep, the question is a serious one. I have laid it on some of my runs for the last two months, and have only found three sheep killed by it, and I think it likely they have been killed by the grain having in some places been laid too thick. The way to lay it on a sheep run is broadcast, and the quantity not more than a sower would cast at the rate of one bushel to the acre. I have laid many miles of it of this thickness without harm to anything except the rabbits, and a few kangaroo and kangaroo rats.

When I used wheat I found many white magpies were killed, but since using oats only a few. Crows appear almost poison proof. I think I have half the crows in the district here, and, as yet, have only seen a few killed, although they manage to clear up any number of dead rabbits the day after they (the rabbits) are killed.

My dogs live on the rabbits, and, as yet, without much harm —I have known them get a little too much, but a little strong tobacco water soon puts them right.

I will now give you my recipe which I can warrant, and if I was very hard up I would undertake to clear any estate infested with rabbits. The oats, if possible, should be crushed— as they absorb the poison better—and when once poisoned any amount of rain does not appear to affect them, which might not be the case if uncrushed; if crushed they should afterwards be winnowed to blow away the husks. In 1½ gallons boiling water with five teaspoonsful muriatic acid, put 1 oz. strychnine, (less water will be sufficient if the grain is not crushed, say 1 gallon). Stir and let stand for 10 minutes. With this solution pickle, in a tub, 80 lbs. of oats, or 120 of wheat or rye. Stir well until all is wet, let stand until next day when it will be ready for use. Lay it in trains, or broadcast it wherever the rabbits feed—if in trains not too thick—2 bushels will reach nearly two miles if properly laid.

As to the success I have met with, I can only say that I have killed many thousands; my men have collected some thousands of skins for which I pay them, as an inducement to them to lay the poison properly. I give them the use of all the sheds to dry the skins, which is done by hanging them on nails just as they come off the rabbits (inside out); but it is impossible to say the numbers that are destroyed, as in scrubby places I do not think more than half are found.

Where it is a marsh that rabbits frequent, and it can be cleared of sheep, so that the grain can be spread thick, many hundreds can be killed in one night; but it is often the case that the first evening it is laid it is not eaten—I think from some smell about it they do not like, which goes off by exposure.

I think that late in the summer will be a very good time to work on them, as they leave the dry hills for any marshy ground, and can then be got at easily. I killed a great many with acorns, cracked and mixed with this solution, and believe that in the dry weather leaves (such as elm leaves) soaked in it and spread would kill numbers.

I never knew the rabbits before this season eat the ferns and wattle bark. I also notice that where they bark the wattles they are generally very poor. This, of course, may arise from shortness of feed, but if you pass on half-a-mile, to where there are few wattles, the rabbits are as fat as pigs. I have weighed them upwards of four pounds, when skinned and dressed. The leaf of the fern they leave, and eat only the stem; the same with dead thistles, they eat all the stem and leave the old leaves.

ROYAL SOCIETY.

OCTOBER, 1871.

The monthly evening meeting of the Society was held on Tuesday, the 10th October, M. Allport, Esq., in the chair.

The following gentlemen, who had previously been nominated by the Council, were after a ballot declared duly elected as Fellows of the Society, viz., John Swan, Esq., M.H.A., W. E. Crowther, Esq., and R. J. Creasey, Esq.

The following returns were brought under notice :—

1. Visitors to Museum during August, 1,241 ; September, 849.
2. Visitors to Gardens during August, 1,779 ; September, 2,214.
3. Plants, seeds, &c., received at and sent from Gardens during August and September.
4. Plants supplied for decoration of public places during August and September :—
   - *a.* For Government House grounds 50 plants.
   - *b.* For Public Offices and Franklin Square 48 plants.
   - *c.* For Public Buildings, Launceston, 18 plants.
   - *d.* For Green Ponds Church 100 plants.
   - *e.* For Catholic Cathedral, Harrington-street, 60 plants.
5. Time of leafing, flowering, &c., of a few standard plants in Society's Garden, during August and September.
6. Books and periodicals received.
7. Presentations to Museum.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., table for September.
2. Port Arthur, from A. H. Boyd, Esq., table for August and September.
3. Westbury, from C. Belstead, Esq., table for August and September.
4. Swansea, from Dr. Story, table for August and September.
5. Sydney, from the Government Observer, printed tables for June and July.

The Secretary then read the Notes on the Meteorology and Mortality of the Hobart Town Registration District during the month of September, 1871, by Dr. E. Swarbreck Hall.

The presentations to the Museum were as follow :—

1. From the South Australian Institute Museum, Adelaide—A named collection of bird skins from the Northern Territory. (56 specimens, comprising 36 varieties.)
2. From Mr. D. Chisholm—An Arabic or Persian coin, found at Clarence Plains by Mr. W. Free. A specimen of *Syngnathus*, and one of *Hippocampus*.
3. From Mr. J. Cassidy—A Spirifer (silicified), from Point Puer, Tasman's Peninsula.
4. From Mr. E. J. Webb—Two white cockatoos.
5. From Mr. Baynton, Brown's River—A specimen of the "native bread."
5. From Mr. Ross, Battery Point—A Snake, said to be from Fiji.
6. From Mr. Stephens—A fine specimen of the large Australian Volute. (*Voluta magnifica.*)
7. From Mr. W. Simpson—An unusually large egg of the domestic goose. Weight of egg 10½ oz.

8. From Mr. J. W. Graves—A common Sparrow, one of several found dead, probably poisoned, in Macquarie-street.
9. From Mr. J. Pearce—Two American notes ("Greenbacks"), value 50 cents. and 10 cents.
10. From Mr. J. W. Graves—Bulletin of the French Acclimatisation Society, Nos. 3 and 4, March and April, 1869.
11. From Hon. J. A. Dunn, Esq.—Two pamphlets on South Africa, forwarded by Sir H. Barkly to the Government of Victoria.
12. From Mr. Clifford, per Mr. M. Allport, skull of Wild Boar from New Zealand.
13. From Mr. R. C. Read, New Norfolk—A recent specimen of Swainson's Lorikeet *(Trichoglossus Swainsonii)*, shot at New Norfolk, from among a flock of common green parrots.
14. From Mr. F. S. Edgar—Shell of small Turtle.
15. From Mr. W. Felmingham, per Mrs. C. Meredith—A fish, *(Uranoscopus sp.)* caught near Maria Island.
16. From Mr. W. Hatton, Elizabeth-street—A copy of Barker's Bible, printed in 1637.
17. From Mr. Wiggins—A fish, probably a species of Carp, from Mauritius.
18. From Captain Williams, of the Kestrel—Four shells from East Coast, Tasmania.
19. From the executors of the late Mrs. Butler—230 specimens of shells. An earthenware lamp from a tomb at Misenum, Naples. Portion of a human jaw from Pompeii. A small earthenware cup from an ancient tomb at Athens. Mosaics, &c., from Baiæ Beach, near Cumæ, Naples; &c., &c.
20. From Mr. J. G. Moir—Fossils (casts of *Spirifers*, &c.) from the limestone, near Brown's River.
21. From Mr. J. Mitchell—A French coin (Dix centimes) Napoleon, III., 1856.
22. From the author, Baron F. Von Mueller—A pamphlet on "Forest culture in its relation to industrial pursuits."
23. From Mr. W. Blyth, Honeywood—Seeds of Waratah.
24. From the Rev. H. D. Atkinson—Three geological specimens from Peppermint and Birch's Bays.
25. From Mrs. Fielding Browne—23 silver, and 22 copper coins and tokens, viz.:—*Silver*: One 5 lire, Italy, Napoleon I., 1808; five 10 cents, ditto ditto, 1808; one 10 soldi, ditto, ditto, 1813; one franc, France, Charles X., 1826; one half ditto, ditto ditto, 1827; one ditto ditto, Louis Philippe, 1843; one ditto ditto, 1835; one coin, Spain, Philip V., 1738; one quarter dollar, ditto, Charles III., 1768; one ditto, ditto, Charles IV., 1799; one dime, America, 1845; ditto ditto 1845; one half-crown, Bank of England token, George III., 1808; one shilling, colony of Essequibo, George III., 1808; one quarter, ditto ditto, 1816; two quarters (cut) of Spanish dollar, 2 unknown. *Copper*: One penny, George III. (?); one half ditto, George II., 1735; ditto, Prince of Wales (no date); one half anna, East India Co., 1845; one 20 cash, ditto, 1803; one coin, French Republic; one coin, Isabella II., Spain, 1836; one ditto, Brazil, 1828; two ditto, Russia, 1831, &c.; one 10 cents, Napoleon I.; two doits, Java, &c.; seven English and colonial tokens.

The SECRETARY directed attention to a handsome present of books received from America, through the Smithsonian Institution. Among these were the recent publications of the Smithsonian Institution; the Boston Society of Natural History; the Department of Agriculture, United States; the Essex Institute; the American Philosophical Society; the Portland Society of Natural History; the American Academy of Arts and Sciences, Boston; the United States Coast Survey Department, &c. &c.

The SECRETARY in bringing under the notice of the meeting some products of the beet prepared by Mr. Atkins, of the Cascades House of Correction, observed it was well known that the Society had long recognised the great value of the sugar-beet, and information in reference to it has from time to time been obtained and placed before the public. Papers by two of our members, Mr. Barnard and Mr. J. Walker, giving some details as to the beet sugar manufacture have been read at former meetings. From these and from other notices in the public press a considerable amount of attention had been directed to the beet-root, and in anticipation of a demand for fresh seed of the best quality—the White Silesian—a plot of ground in the Society's Gardens, had been planted with this variety. The meeting would be glad to hear that this anticipation had been fully realised, so that within the last few weeks applications had been received from upwards of seventy individuals from various parts of the colony, to all of whom parcels of seed have been furnished. It had now, therefore, been extensively distributed over the island, and no doubt the growers would of themselves take care to preserve in future whatever seed they may require whether for cultivation, sale, or distribution. As to attempts to extract the sugar from the beet he (the Secretary) thought they would be premature. In the neighbouring colonies they were vigorously at work attempting to solve this problem economically, with greater means and resources than Tasmania at present could command. In the course of a year or so we should have all the benefit of our neighbours' experiments without loss of capital, or misdirected energy on our part, and in the meantime it would be well for our farmers to acquire further knowledge of the beet, its best mode of cultivation, the soils most suitable for its growth, &c. (Hear.) Only an hour or two before the meeting he had received a note from a correspondent, experienced in the general management of stock, who informed him the beet was not only admirable for cattle and horses, but was also most excellent for poultry of every kind. In all cases it was given in the raw state. From Mr. Jackson, the owner of a dairy at Sandy Bay, the Society had received a communication on this subject from which he (the Secretary) would read. "Last season was so bad that I had got no crop from mangolds after sowing them twice. I put in some beet seed quite as a forlorn hope in December, which was two months later than it ought to have been. From these, late as the season was, I had six tons of roots to the acre, and have since had reason to be so satisfied of their value for feeding purposes that I shall for the future pay a great deal more attention to their growth. The cattle eat them most ravenously, and are not so subject to scouring as on mangolds. They give no disagreeable flavour to either milk or butter."

The SECRETARY read the following communication, from the Hon. J. Maclanachan, Esq., on the rabbit nuisance:—

Ballochmyle, Tunbridge,
31st August, 1871.

My dear Dr. Agnew,—In compliance with your request I give you my experience in the destruction of rabbits as briefly as I can.

Previous to August, 1870, I used guns only without any apparent diminution of their number. On the contrary they increased to such an extent that I saw, if allowed to continue, starvation and death to every other grass-existing animal would be the consequence. I determined to cut down all the gorse about the homestead and fences on the runs, and hearing that the Messrs. Taylor, of Macquarie River, had been very successful in blocking them up in their burrows, I adopted this plan and succeeded beyond my expectations. The work is rather slow, but sure, if properly done. My mode of doing it was with round wood of any sort cut into billets 18 or 20 inches long, and in every burrow had a billet larger than the hole, driven in by a strong man with a heavy iron maul, as far as he could get it, which was generally a little way inside the burrow, then level down the entrance of the hole over the end of the billet of wood, and the thing is complete. Its success, as I have said before, depends entirely on the work being properly done. Trustworthy men, if possible, should be employed; failing this, doubtful men require constant watching. When properly done very little fear of rabbits burrowing out, but great danger of outsiders burrowing in. To meet this I let the men have a fast dog to pick up outsiders, and made them begin work at the homestead and work outwards, so that they had to walk to and from their work daily over the work previously done, and wherever they saw a new burrow to block it up at once. I continued this work until the end of October, 1870, when other work compelled me to leave it off until March of this year. At this busy time failing to get good men I adopted another mode—that of giving ninepence a dozen for all grown rabbits killed on my ground and brought to me every night to be counted; and to prevent the possibility of their being brought a second time I cut one ear off each rabbit. For a short time the hands employed killed at the rate of 1,200 and odd a week, but the numbers soon became less and gradually decreased. On some parts of the land not two rabbits are to be seen where hundreds were before, and on all other parts, so much reduced in numbers, as to convince me that, if every sufferer from these pests would go at them with a will the nuisance would soon be very much abated, and with perseverance put down altogether, but this will not be done without the aid of Parliament.

During the lambing season I stopped the men and tried the poison (strychnine), first with fruit and carrots with good results, and afterwards with oats slightly crushed with still better results. The mode of preparation has been so well described by Mr. Bisdee, of Hutton Park, from whom I got it, that I need not repeat it. I made small enclosures to put the poisoned oats in that the sheep could not get at it. I find now the grass is growing. The rabbits are so shy of the poisoned oats that I have again employed hands to kill them at so much per dozen. I believe the blocking up with good men to be the best mode tried except the poisoned oats.

Yours, &c.,

J. MACLANACHAN.

Mr. Swan said when the ground was sandy the rabbits could easily be destroyed, by simply filling in the burrows to the extent of a foot or two with the sand. He had frequently seen dead rabbits taken out after this process. It was satisfactory to know that the expense of destroying them was partly recouped by the value of the skins in the English market. In London they had sold at 2s. 1d. per dozen, and at Bradford as high as 3s.

Mr. T. Giblin observed the export of skins was assuming great proportions. Mr. Fysh alone had exported 13 bales, in addition to which Mr. Bidencope had sent a large number.

The Bishop of Tasmania felt that Government assistance was required, in order that some general and systematic action should be taken in the matter. It was useless for one or two settlers to destroy rabbits if their neighbours, whether owners of land or Crown tenants, made no attempt to clear their runs. It was well, however, to know that, as far as he could learn, the rabbits were really not making much headway except on sandy ground. He thought it would tend much to their destruction if their flesh possessed an economic value, and this could readily be given to it by the formation of meat-preserving companies. Both flesh and skins could then be profitably disposed of.

Mr. Gould, whilst agreeing that some general action was necessary, was afraid, if the tenants of the Crown lands were taxed for the purpose, that in many cases they would throw up their holdings, and how in such cases could Government act?

The following extract from a letter received by the Governor from F. S. Corrance, Esq., M.P., was read:—

"In reference to your remarks on your salmon question, I have only to observe that in my opinion, even after the inhabitant shall have declared himself in a most unmistakeable way, it will be at least some years before the fish could become sufficiently abundant for fishing for them, to have a chance of meeting with much success. It is, moreover, by no means an invariable propensity of the race to rise at a fly at all, and in the European rivers limited to about one-half. In none of the Dutch, nor Swedish, and in few English rivers is this the case, and it depends, as I think, upon the habits of the parr and smolts in their early life whether they do so or not. So you see that this part of the problem is scarcely likely to be worked out in your time at least. You say that the fords, &c, of the upper waters are more than 100 miles off, and that the banks of the river Derwent in those parts run for many miles through an uninhabited and almost impassable district. I do not think that ought to present an insuperable objection to an exploring expedition to that district at the proper time of year, by competent persons, and I should think such an expedition would be generally popular, considering the important results to the colony of a successful solution of this problem. All the shallows should be watched and reported upon. The time of year would be the autumn months."

His Excellency adds:—

"The writer of the above remarks is my brother-in-law, and there are few more experienced salmon fishers to be found in England, or possessing better knowledge of the salmon rivers of the United Kingdom and continent of Europe."

Mr. M. Alport repeated what he had expressed on a former occasion, viz., that the expense of watching the upper waters of the Derwent would be far beyond the means at the disposal of the Salmon Commissioners. If we knew where the spawning beds were, it would be easy to watch them; but to search for them during the season would be a work of vast trouble and expense.

Mr. Gould read a paper on the geological structure of Flinders' Island in Bass' Straits, and illustrated his remarks by a large and very beautiful collection of specimens obtained by him during his stay there. He especially directed the attention of the meeting to the exceptionally fine crystals of Orthoclase Felspar, which had been obtained from cavities in the granite, and which he considered equalled in perfection those obtained from any part of the world. He also exhibited specimens of beryl, remarkable varieties of granite, specimens of crystals of topaz and felspar *in situ* in masses of rock, and supplemented his paper by a variety of additional observations elicited by the attention of the members to the examples before them—more especially in regard to a sample of tin ore of great purity and value.

Further discussion of a conversational character ensued, in which the Rev. Brooke Bailey, Mr. Barnard, Mr. Stephens, and others took part. A vote of thanks having been accorded to Mr. Gould for his valuable and interesting paper, and to the donors of presentations, the meeting terminated.

NOVEMBER, 1872.

The monthly evening meeting of the Society was held on Tuesday, the 14th November, His Excellency C. Du Cane, Esq., President, in the chair.

The hon. Mrs. Du Cane was present, and also several visitors from the neighbouring colonies.

The hon. P. O. Fysh, Esq., M.L.C., who had previously been put in nomination, was after a ballot declared duly elected a Fellow of the Society.

The following returns were brought under the notice of the meeting:—

1. Visitors to Museum during October, 921.
2. Ditto to Gardens ditto, 2,568.
3. Times of leafing, flowering, and fruiting of a few standard plants in Society's gardens during October.
4. Books and periodicals received.
5. Presentations to Museum.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., table and summary for October.
2. Port Arthur, from A. H. Boyd, Esq., ditto for September.
3. Westbury, from F. Belstead, Esq., ditto ditto.
4. Swansea, from Dr. Story, ditto ditto.
5. Melbourne, from the Government Observer, printed notes for August.

The Secretary read the notes on the Meteorology and Mortality of the Hobart Town Registration District during the month of October, 1871, by Dr. E. Swarbreck Hall.

The presentations were as follow:—

1. From Master Wm. Jefferson, Fernshawe, Victoria, (per J. W. Graves, Esq.), nest and egg of Lyre Bird, (*Menura superba*, and four other nests, with eggs, from same locality.
2. From Mrs. J. Sanders, Hobart Town, a singularly shaped Sponge, from Recherche Bay.
3. From H. B. Tonkin, Esq., 6 fossils, (casts of *Helix sp.*), from Risdon.
4. From Mr. Weymouth, a small map of Tasmania published in 1830 by Ross. (This copy is believed to have been used by John Batman, whose name it bears.)
5. From Mr. W. Josephs, a small copper coin, probably Persian, picked up at Clarence Plains.
6. From Captain Williams, an English halfpenny token, 1788.
7. From Dr. Hector, Wellington, catalogue of birds of New Zealand.
8. From the Hon. J. Maclanachan, Esq., a Carolina duck *(Dendronessa sponsa.)*
9. From M. Allport, Esq., specimen of Kauri Gum from New Zealand.
10. From T. Stephens, Esq., specimen of Travertine from Dunrobin.
11. From the author, Mr W. Legrand, a copy of the 2nd edition of "Collections for a Monograph of Tasmanian Land Shells."
13. From Mr. Hissey, Skeleton of a Fox *(Canis vulpes.)*

Mr. STEPHENS called attention to a specimen of travertine from Dunrobin (presentation No. 10), the property of Mr. Bethune. As in most of the other instances which have come under notice, it appeared to have been formed by the percolation of water, holding lime in solution, and probably springing from beds of limestone concealed beneath other members of the Upper Palæozoic series which show on the surface. If any extensive deposit of this rock should be found it might possess considerable economic value, especially as a renovator of exhausted soils. Mr. Stephens mentioned that two strange birds had been found lying dead among the drift wood floating down the Derwent near its junction with the Ouse. An examination of the beak and feet proved them to belong to a small species of Petrel (*Procellaria*), a bird which is very rarely found so far inland. He also exhibited an almost new shell (*Voluta Sclateri*), of which not more than three specimens have been seen, and which is therefore highly valued by collectors. It was obtained near Kelso, by Miss Sharland.

As to presentation No. 11 Mr. STEPHENS remarked that Mr. Legrand's Monograph included 14 new species discovered since the publication of the first edition. Several other members spoke of the great zeal and energy of Mr. Legrand in this branch of Natural History.

Mr. ALLPORT, in the absence of the author, read a continuation of Mr. Gould's remarks on the islands of Bass' Straits. (The first part was read at the last monthly meeting.)

As to the wanton and stupid destruction of the seals, referred to in the paper, Mr. ALLPORT remarked that nothing could more clearly show how necessary it was that the legislative measures for the protection and preservation of our valuable fish and other animals should be strictly carried out.

Mr. ABBOTT read some notes as to the recent results arrived at by the Royal Astronomical Society relative to the fluctuations of the star η argus and its surrounding nebula.

Mr. S. Smith TRAVERS read the following interesting and suggestive communication :—" Our fellow townsman, Mr. Aldred, having described to me a process by which he was of opinion that fowls' eggs might be imported from England, with their vitality so unimpaired, that they might be hatched, I am happy to say that having tried the experiment it has succeeded, and that an egg laid by a La Hécke hen in North Wales on the 1st of May was hatched on 10th October, and produced a very fine chicken. Mr. Aldred's instructions were to place the egg, immediately after laying, in an upright position, with the air bubble uppermost, that is to say with the broad end of the egg upwards. He insisted particularly on no time being lost between the moment of laying and the placing the egg in this position. Whilst in this position they should be dipped in a solution of gum arabic, and put in a case fitted with holes, in which they would retain their vertical position. I received only six eggs that were collected by a person in England on whom I could depend for an exact obedience to these instructions, and out of these six eggs two were found to be cracked. Of the four which remained, and which were duly placed under a hen, one was found to be decomposed. Two contained half-formed chickens, and the fourth produced the fine chicken I have referred to. The success of the experiment would have been on a larger scale, though not more perfect, if more care had been taken to preserve the case containing the eggs from the effects of the incessant motion, and very often violent concussion incident to a sea voyage. As it was, the case was fitted with a frame, in which it hung by means of an universal joint. But the frame was screwed to the deck, and only performed the part of keeping the eggs in the desired vertical position. Had the frame been suspended by elastic straps, I feel confident I should have had to report a larger measure of success. I think it surprising the vitality of the eggs should have survived the violent shaking that they must have endured owing to the rigidity of their frame. The time that elapsed from laying to hatching is remarkable, but still more when it is considered how much of that time was passed in the tropics in a hot cabin ; and I hope that the experiment will be carried out on shore, and for a longer period of time, with the object of finding how long eggs under such conditions may be kept. If it be possible to hatch an egg after a lapse of five months, why not after five years?"

Conversation ensued in which the President, the Secretary, Mr. Abbott, Mr. Allport, Mr. Stephens and others took part.

Mr. Justin Browne proposed the usual vote of thanks to the authors of the papers just read, and to the donors of presentations. He observed that (although it did not apply to the present meeting) papers might occasionally be brought forward of no particular interest to any present, yet these very papers might be of great interest to many readers at a distance. They composed the bulk of the Society's Transactions, and these were of great value as serving to keep up friendly relations and exchanges throughout the world with kindred societies, which otherwise might have little prospect of obtaining that knowledge of our Natural History, &c., which was of peculiar interest to them. The vote having been unanimously agreed to, the meeting separated.

THE ISLANDS IN BASS' STRAITS

By C. Gould, F.G.S.

[*Read* 10*th October*, 1871. *The paper was illustrated by a variety of choice and remarkable specimens.*]

Visits to the islands in Bass' Straits are so rare that I feel certain the members of this Society will accept a contribution to the natural history of the group without objecting to its brevity, and to its somewhat desultory character, induced by limited opportunities of observation.

Indeed the position and grouping of the islands render them especially interesting, whether our attention is directed to them as affecting their geological aspect—presenting as they do the connecting link between this island and Australia, and containing integral though distant parts of formations common to both countries—or to their mineralogical importance from their presenting a variety of mineral species not hitherto found elsewhere within the colony, or if so only rarely, many of them beautiful, some comparable in point of crystalline perfection with their congeners in any part of the world, and others possessing a substantial value of such importance as to justify a hope that at some future day their discovery in greater abundance may initiate novel and important mining adventures. Again, the researches of the field naturalist are eminently favoured in this locality by the harbour which its seclusion offers to various cetacea, and the numerous species of waterfowl now so rarely met with, or even almost extinct upon the shores of our own island, while the natural shelter of the outlying reefs and larger islands encourages the production of various mollusca less abundant or unknown on our own exposed coasts.

My visits, made during the past summer, were principally to the western side of Flinders and to Cape Barren, taking incidentally the smaller islands lying off them; but I had no opportunity of visiting the eastern coast of Flinders, which is an enterprise of some hazard from the heaviness of the seas and absence of boat harbours, while my leisure did not permit a visit to Clarke's Island, which is the southernmost of the group.

The small coloured plan which I lay on the table of the Society will convey a fair general impression of the structure of the islands in so far as the oldest rocks are concerned. To express, with any accuracy, the distribution of the tertiary deposits which overlie them, would require a much more minute examination than I was able to afford; their sinuous extension between the ranges, and somewhat capricious occurrence upon their flanks, corresponding with the similar peculiarity observed in the occurrence of the tertiary deposit upon the N.E. Coast, with which they perfectly correspond.

The physical features of these islands are expressed somewhat more minutely in the general map of the colony by Mr. Sprent than is usually the case, but still it conveys no adequate idea of the strange appearance presented by the great granite ranges standing out abruptly like headlands or craggy islands from the plains of tertiary land, level as a sheet of water for miles, stretching for miles in length and width around their base, and winding in bay like valleys between them.

These plains are mostly sand or coarse quartz gravel derived from the adjacent granite rocks. This has been generally denuded away where the ranges butt against the coast line; but occasionally sections remain, showing friable sandstones with an amount of false bedding, which almost suggests unconformability, or impure limestone, the source of springs crusting the cliffs with tufaceous deposit.

The ranges in Flinders are with one exception (that of the Patriarchs), confined to the western coast line, and the highest point determined by Mr. Sprent was the summit of Strzelecki Peak, which has an elevation of 2,550 feet. They are nearly entirely composed of granite, and although, in some instances covered by forest and scrub, are for the most part bare and rocky masses, affording a great variety of really grand and very beautiful scenery. The slopes of these ranges, and the tertiary plains surrounding them, form a vast open grass tree country with only occasional belts of tea tree, and similar scrub. The true grassy portions of Flinders are restricted and patchy, the most important being situated on the extreme north end of the island, opposite to the Sisters, and in the vicinity of the settlement. Cape Barren is generally mountainous, and unfitted for occupation, the lower portion and plains bordering the ranges forming grass tree open country as in the case of Flinders. The smaller islands seem to be those best adapted for pastoral purposes, and most of them produce a rough coarse grass on which sheep manage pretty well. These are chiefly granite also, but being of low elevation have the advantage of exposing the most recent tertiary beds, containing a large amount of lime in the form of unaltered shells, closely allied to existing species. Many of them have also been at one time, or are still, highly manured by the existence on them of mutton bird rookeries. The plan exhibits outlying patches of Silurian rocks; these are of unimportant extent, relatively to the general area of the island,

and for the most part occupy inconspicuous and low positions. The only exception occurs about five miles eastward from the settlement, where two parallel strips of clay-slates occur, perched on the granite base, and culminating in hills about 1,000 feet in height. An area of about five miles in length, and four in breadth, is chiefly occupied thus by clay slates and sandstone; these are traversed by thin quartz strings, and occasionally by veins of quartz of tolerable dimensions.

Other outliers of slatey rocks occur on Badger Island, occupying about one half of it; upon the shores of Franklin Inlet adjoining Adelaide Bay, upon the north side of Cape Barren near Deep Bay, and at Cape St. John.

These have hitherto proved barren in metals with the exception of pyrites veins. And their chief interest is derived from the proof which they offer of the continuation northward and eastward of the great system of anticlinal and synclinal folds, which I have at various times shown before this Society to pervade and completely control the disposition of all the oldest formations in the colony. Thus we may readily conceive the outliers at Brougham's Sugar Loaf, and at Badger Island, and Cape St. John, to be on the respective slopes, if the expression is intelligible, of the anticlinal axis whose continuation traverses the main land south of Waterhouse Point, in the direction indicated on the chart, while the outlier fronting on the Franklin Inlet may show a continuation of the line of flexure on the extreme east of the colony, passing through Mt. William and the Scamander tier.

Trap rocks are exceptional altogether among the islands, but occur to a limited extent, and most unexpectedly in a few widely separated spots, either in the form of narrow dykes traversing the granite or of overflows of basalt—such as those marked at Killicrankie Bay, and in the neighbourhood of Mount Eliza and Sanfra Island; these are chiefly compact hard basalts, but on the surface vesicular and zeolitic.

The following is a list of minerals met with by myself, or reported to me, as occurring among the islands, to which I have appended the localities and the formation in which they occur:—

1. *Gold* was obtained by me in traces on Cape Barren Island. None whatever was found on any part of Flinders, and the stories current as to the discovery of gold there have not been substantiated. It is almost needless, however, for me to add that it is always possible that some may be discovered in the Silurian outliers near Brougham's Sugar Loaf, but the general aspect of those rocks is certainly unfavourable.

2. *Copper Ores.*—Stains of copper ore are said to occur on Pruin,

Seal, or Hummock Island of the Chart, and on Kent's Group, neither of which was I able to visit.

3. *Arfvedsonite.*—"A highly ferruginous variety of amphibole or black hornblende," containing one per cent. of copper. "The copper which it contains exists in part or all as oxychloride coating the crystals of Arfvedsonite" (G. Foord), locality Swan Island.

4. *Tin.*—The oxide of tin occurs in various parts of Cape Barren Island, and of Flinders Island as stream tin, in rolled fragments. This is the most valuable form in which the ore is obtained; it contains about 75 per cent. of tin, and the value varies from £80 to £100 per ton, according to recent fluctuations of the market.

5. *Bournonite.*—An ore of antimony and lead, occurring in patches near the junction of the slates and granite on the south-east shores of King's Island.

6. *Iron Pyrites.*—Marcasite, often mistaken for gold by the islanders, is a variety of iron pyrites, and occurs in veins in the slate formation.

7. *Topaz.*—This mineral occurs in crystals and washed pebbles in great variety of form, colour, and size, and in many localities associated with oxide of tin, zircons, tourmaline, etc., etc. It is derived from the granite, and crystals may, though rarely, be obtained *in situ* from rugs in the granite, together with rock crystal and with crystallized feldspar. I have the pleasure of introducing one very beautiful example of this to the notice of the Society. They are abundant on the north-east side of Killicrankie Bay in a creek descending from the ranges, and upon the beach, and are equally so in a gulchway about two miles south of the first-mentioned spot, and across the bay from it. I also found them inland in the creek descending westward from the Quoin, and in the Sanfra River on the south side of Flinders. I am also informed of their discovery in other creeks on the south end of Flinders, diverging from the peaks, and in a variety of spots upon Cape Barren Island; such as in Deep Bay and vicinity of Dover River upon the north, and Battery Bay and Kent's Bay upon the south side of Cape Barren. They are also occasionally found upon the outlying islands.

In regard to their occurrence, I may note that a remarkable feature in the granite is usually the index of their presence.

This rock which is in general throughout the islands an ordinary ternary granite moderately close-grained, or occasionally somewhat porphyrytic, appears to have been subjected to some abnormal condition of cooling, which has resulted in certain localities in the aggregation of its constituent minerals into masses of exceptional size. Thus it is not unusual to see vein-like streaks traversing the granite, varying from one to several feet in width, and composed of a material which can only be illustratively described as granite highly magnified. The materials are identical with those of the surrounding granite, but the size of the individual minerals is enormously increased, so that blocks of feldspar quartz and even mica occur, up to several feet in dimensions. These appear to be the scene of the most abundant sources of the topazes which have crystallised out into natural cavities, from whence they have been delivered by erosion.

The colour of the topazes varies from pure limpid white to various shades of blue, faint pink, yellow, &c. Crystals are found up to several inches in diameter. They are readily obtained by washing, as their specific gravity, which varies from 3·4 to 3·7, is considerably in excess of the quartz (2·5—2·8) and other constituents of granite.

8. *Beryls* are occasionally obtained in the form of hexagonal prisms, colourless or bluish green, free or *in situ*.

9. *Zircons*, are tolerably common, but rarely found in well defined crystals.

They are usually met with in washing, in broken rolled fragments; localities, Killicrankie Bay, and in crystals in quartz from granite, Long Islands.

10. *Tourmaline*, black variety, very abundant and in exceedingly fine crystals on the northern side of Long Island; also occurs on various parts of Flinders and Clarke's Island.

11. *Garnets*, often found in washing in various streams, but especially abundant on the south side of Cape Barren, near Half Moon Bay, where they occur almost as a constituent of the granite rock, and in confused crystallization.

12. *Chrysolite.*—I found only one example on Flinders, from the granite formation.

13. *Red Hematite*, both in the hepatic form and in well defined crystals, occurs on the south end of Flinders, on the beach in basalt, S.W. of Mount Eliza.

14. Exceptionally beautiful crystals of feldspar occur in the neighbourhood of Killicrankie, north boat harbour, in the rugs in granite, often four or five inches in diameter, and very perfect. The species appear to be orthoclase.

15. *Rock crystal* is not uncommon; beautiful examples are obtained from Kent's Bay, on the south side of Cape Barren Island; and very large crystals of smoky quartz are said to be obtained from hollows in the granite on Flinders, opposite Woody Island.

16. *Mica.*—Large masses in spots indicated above.

17. *Kaolin* of fine quality is frequent about Killicrankie Bay, and generally through the island.

18. *Mineral Pitch*, a species of, occurs on thenorth end of Pruin Seal. I had no opportunity of visiting the locality.

[*Read* 14*th November*, 1871.]

In continuation of my remarks upon the islands in Bass' Straits, I have now to advert to the Mammalia and, more especially to pen the deplorable memento of the gradual decrease, and now rapidly approaching extinction of some of those species adapted by form and structure to inhabit the wildest and least accessible spots, and whose abundant presence formerly on the detached reefs and rocky coasts throughout the group must have imparted a gratifying air of animation to what are now dumb and barren solitudes.

It is well, I think, for naturalists to begin to assemble the pages of the history of a species without waiting until the tombstone has been finally erected above it, and I have therefore gathered from the journals of the earlier voyagers such incidental remarks as illustrate the aspect of the island in point of the abundance of the amphibious carnivora, prior to the hostile invasion of man.

It seems hardly credible that wanton apathy should have permitted a wholesale extermination at all seasons of so valuable an article of commerce; but true it is that no steps appear ever to have been taken to afford protection to the various species of seal during the fence season, and the inevitable result of so persistently ungenerous a persecution, has been their almost total disappearance from localities once abounding in them by thousands.

A correct foreboding was expressed by a writer in the Hobart Town *Gazette*, March 25th, 1826, in the following terms:—"It is evident that the Legislative Government must enact a law for the fishery of seals at improper seasons, else this most valuable source of colonial export will soon be lost. There are two species of seal in these seas. The early kind brings forth its young from the 25th November to the latter end of December, and the reefs and banks should be left undisturbed until May following, when the increase will be grown up and the skins well furred. The black seal, which is the most valuable, is a month later.

"The unthinking sealers harass these useful animals at all seasons, and the consequence is that many reefs are deserted, and inferior skins have been procured from animals too young, and imposed upon the merchants."

I cannot find that action was taken upon this remonstrance. The seals appear then to have been still abundant, and a prompt interference might not have been too late. The skins alone were valued at 5s. each, and a case is quoted in which 300 cubs had perished on one bank alone through the untimely destruction of the dams.

It is to be regretted that we have no reliable description of all the different species of seal once inhabiting the coasts of this island, and of those in Bass' Straits. That the number was more considerable than is generally imagined may be inferred from an expression occurring in Lieut. Colonel Collins's History of New South Wales, conveying observations made by Mr. Bass in the course of one of his earliest explorations, to the effect that: "The seals appeared to branch off into various species. He did not recollect to have seen them precisely alike upon any two islands in the Strait. Most of them were of that kind called by the sealers hair seals, but they differed in the shape of the body, or of the head, the situation of the fore fins, the colour, and very commonly in the voice, as if each island spoke a peculiar language." These are clearly specific differences, and not such as might be attributed to local variations. Mr. John Gould, in his large illustrated work upon the "*Mammals of Australia*," has figured two species, and speaks of the seals as being even in his day of rare occurrence or almost extinct. My own enquiries have led me to the belief that three very distinct species still remain extant, and possibly a stray wanderer from the south belonging to the tribe of the great sea elephant may occasionally pay a hurried visit to the ancient domain of his ancestors. We have no authentic record, however, of such having been the case within late years, but it must be remembered that the once favourite spots of these gigantic sea monsters are upon a remote island, and in that portion of it now rarely visited, while it would be only during a limited period of the year that these animals might be looked for.

It is remarkable that neither Bass nor Flinders give any special account of the sea elephant, although the latter visited King's Island in the year 1802, in the month of April, near the time when sea elephants should have been arriving in their migration from the southward. However, Mr. Flinders' stay was short, and only paid to one portion of the coast, and it is possible that as this island had already been known to sealers for three seasons, having been discovered by a Mr. Reid prior to 1799, that the wholesale slaughter of these helpless and inoffensive monsters had already gone far towards their expatriation. Mr. Flinders obtained one example of which he says: "A seal of a species different to any yet seen by us was also procured; its flippers behind were double when compared to the common kinds of seal, and those forward were smaller and placed nearer to the head; the hair was much shorter, and of a bluish grey colour, the nose flat and broad, and the fat upon the animal was at least treble the usual quantity. I never saw the sea elephant, and possibly this might have been a young female, but there was no appearance of any trunk." It may be noted that both Bass and Flinders appear to have been very familiar with both the hair and fur seal, with neither of which does this description tally. The most full and accurate description, however, has been left us by that very excellent naturalist, M. Peron, in his, "*Voyage de decouvertes aux Terres Australes*," who arrived at King's Island, in Bass' Straits, on December 10th, 1802, and after landing at Sea Elephant Bay was detained there for 15 days by the vessel having to run off shore before a gale of wind through the cable having been chafed asunder by sharp pointed rocks, which are specially referred to as involving such a danger by M. Peron, whose opinion has been fatally confirmed within our own time by the disaster attending the telegraphic cable, which must have been laid down upon the very rocks described by him. Although the bay was habited by a party of eleven sealers, who had been for a long period employed in the slaughter, he described the portion where he landed as being covered with sea elephants, whose brown colour rendered them conspicuous on the beaches, and caused them to appear from a distance like great black rocks. On his approach some fled, while others remained motionless on the sand and regarded him with indifference. Elsewhere he says, "all the coasts of this island are covered with a prodigious number of amphibia, some of which attain twenty-five or thirty feet in length, which have become a source of valuable commerce to the English." He speaks of an abundance of emu, and notes the absence of aboriginal inhabitants. The sea elephant was killed for its skin, for the oil which was obtained in large amounts, and for the tongue which was considered a great delicacy. A small portion remained all the year round but the great masses migrated to and from the south, arriving about June, and leaving some months later. It differed from other seals in preferring sandy beaches to rocks, and evinced a partiality to bathing in fresh water; it was mild and inoffensive and easily killed. It was almost entirely confined to the Hunter Islands, King's Island, and New Year's Island, a very few were found on the Sisters Islands, north of Flinders; a few were occasionally forced by tempests on the New Holland and Tasmanian shores, the natives on such occasions destroying the exhausted animal by thrusting flaming brands down its throat! The sea elephant appears to have browsed on kelp, and M. Peron specially states that no remains of fish or any other bony animal were ever discovered within their stomachs. Those who feel further interested in the natural history of this grand and valuable animal will find the amplest details in M. Peron's volumes.

The species next in importance in point of size, though not in value, is the sea leopard *(Stenorynchus leptonyx)*—"*Gould's Mammals of Australia*"—which still occurs sparsely throughout the islands, and occasionally on the coast. This attains more than ten feet in length, and is distinguished from the others by its spotted skin. M. Peron speaks of Waterhouse Island as frequented in his time by great numbers of seals of enormous size, and which were probably individuals of this species. I do not think, however, that it was nearly so abundant generally as the next two to which I shall refer. In regard to these great confusion prevails.

The species *Arctocephalus lobatus* is also figured in the "*Mammals of Australia*," and Dr. Gray is quoted. He states "that this species and the *A. Hookeri* are called hair seals by the sealers, because they are destitute of any under fur;

but this appears to be the case only with the older specimens, for the young of *A. lobatus* is said to be covered with soft fur, which falls off when the next coat of hair is developed." Flinders describes hair seals of enormous size and extraordinary power, as frequenting Armstrong's Channel, one killed by him equalling an ox in weight. I cannot identify this with the *A. lobatus*, as he describes it as having a bull-dog nose, and thinly-set sandy hair, characters not possessed by the *A. lobatus*.

Mr. Bass, in Collins' Hist. N. S. Wales, p. 158, in speaking of Cape Barren Island, says, "The rocks were covered with fur seals of great beauty of a species approaching nearest that named by naturalists as the Falkland Island seal. And Flinders gives a more particular description of them. In speaking of Cone Point, on the extreme S.E. of Cape Barren Island, his words are:—"The number of seals exceeded everything we had any of us before witnessed, and they were smaller and of a different species from those which frequented Armstrong's Channel. Instead of the bull-dog nose and thinly-set sandy hair, these had sharp-pointed noses, and the general colour of the hair approached to black, but the tips were of a silver grey, and underneath was a fine, whitish, thick fur. The commotion excited by our presence, in this assemblage of several thousand timid animals, was very interesting to me who knew little of their manners. The young cubs huddled together in the holes of the rocks and moaned piteously; those more advanced scampered and rolled down to the water with their mothers; whilst some of the old males stood up in defence of their families, until the terror of the sailors' bludgeons became too strong to be resisted. Those who have seen a farm yard, well stocked with pigs, calves, sheep, oxen, and with two or three litters of puppies, with their mothers in it, and have heard them all in tumult together, may form a good idea of the confused noise of the seals at Cone Point."

Mr. Bass speaks of landing on the Patriarch. "He found the outermost island well inhabited. The various tribes had divided it into districts, one part was white with gannets, breeding in nests of earth and dried grass, petrels and penguins had their underground habitations in those parts of the island which had most grass. The rocks of the shore, and blocks of granite, were occupied by the pied offensive shag, and common gull; geese, red bills, and quails, lived in common, and the rest was appropriated to the seals, who seemed to be the lords of the domain." "The males, who possessed a rock to themselves where they sat surrounded by their numerous wives and progeny, on his drawing near them, hobbled up with a menacing roar, and fairly commenced the attack, &c." He unfortunately does not indicate the character of the species—the fur seal observed by Flinders at Cone Point, its sharp pointed nose &c., distinguishing it from the *Otaria Falklandica*, or ordinary fur seal of commerce, which is described as having a broad head and rather flat. A yellowish seal is described by M. Peron as occurring at the I. des Phoques in enormous quantities. He says "the largest, which were of a yellowish colour, occupied the upper portions of the rock, while the smaller, which appear black, filled the cavities in the rocks below." Probably the larger species here referred to was identical with the sandy-haired large seal described by Flinders in Armstrong's Channel, and the smaller black ones with the fur seal at Cone Point. Many other incidental observations on the habits and abundance of seals are made by these old and intelligent observers, for example M. Labillardiere especially draws attention to the fact of a seal killed in D'Entrecasteaux Channel (which he calls *Phoca menachus)* having been found to have been feeding on shell fish. But of these it will be unnecessary to quote more, sufficient having been cited to prove that in the earlier times four, if not five species of seals were abundant in the Straits, viz., *Macrorhinus proboscidens* (Cuv.) or the sea elephant. The sea leopard *(Stenorynchus leptonyx)*, a fur seal, and one, or perhaps two hair seals. At the present day from my inquiries I learn that there remain the sea leopard and at least one hair seal, and one fur seal. The haunts of these are on the double rocks off Moriarty Bank south east of Clarke's Island, the Stacks, or Craggy Island of the charts, between Flinders Island and Kent's Group, Barren Joe's Island, Hogan's Group near Wilson's Promontory, and some of the other rocky islands off the Victorian coast line; more occasionally they are found on the westernmost of Kent's Group and the Sisters Rock. Only the hair and fur seal are pursued, and rather for the oil which they afford than for the skins. One or two small sealing parties still annually leave the islands in the Straits for the purpose of their capture. The seals in Hogan's Group are described as gathering into a vast cavern, only communicating with the sea by a narrow outlet, impassable for a boat, but with a narrow open crevice in the roof above which permits of the most adventurous in the party being lowered by a rope down into the midst of them; they are killed by shooting and clubbing. The number annually obtained, however, from the whole group is but small; what the numbers originally obtained amounted to may be inferred from the following extracts of a few takes recorded by old Sydney *Gazettes*, and quoted by Mr. James Bonwick, from whom I borrow them:—"The schooner Endeavour, from March 9th, 1803, to May 28th, 1804, got 9,514 skins; the schooner Surprise, from March 11th, 1803, to September 15th, 1803, got 15,480 skins. In September, 1803, a vessel brought in to Sydney 11,000 skins."

Sufficient has been stated to show what the value of this fishery might have been if ordinary forbearance had been exercised, and it now only remains, as the past is irrevocable, for those who are interested in the Natural History of these islands to endeavour to procure examples of the different species still existing, in order to clear up as far as possible the doubts as to the nomenclature, before their final extinction.

η ARGUS AND ITS NEBULA. BY F. ABBOTT, F.R.A.S., F.R.M.S.

[*Read* 14*th November*, 1871.]

I beg to bring under the notice of the Society some preparatory results arrived at by the Council of the Royal Astronomical Society, relative to the fluctuations of the Nebula, &c., about the object η Argus.

In the Monthly Notices R.A.S. there appears the following note, together with two additional papers and drawings from Hobart Town.

"On account of the interest attached to the question of the variability of the nebula of η Argus, the Council have determined to print as well Mr. Abbott's communications as the remarks upon them by the late Sir J. F. W. Herschel, and the Astronomer Royal. For convenienc of reference it may be mentioned that Mr. Abbott's former papers are printed in the *Monthly Notices*, vol. xxi., p. 230, (June 1861); vol. xxiv., p. 2, (November 1863), with plate; vol. xxv., p. 192, (April 1865, paper dated 18th February); and vol. xxviii., p. 200, (May 1868, paper dated 29th February), with a plate; and that there is a paper by Sir J. F. W. Herschel, vol. xxviii., p. 225, ((June 1868; and one by him and Lieut. Herschel, vol. xxix., p. 82, (January 1869), with five plates."—Ed.

The Council have referred the subject to the Astronomer Royal, who makes some comments on previous observations to which I have temporarily replied as notes and queries, pending the appearance of the object in a favourable position for new observations, which will be about the month of February, when the notes from the Astronomer Royal will be dealt with seriatim.

The following passages occur in Mr. Airy's remarks on the subject:—

"I duly received the packet of papers relating to Mr. Abbott's observations on η Argus; and with these I have perused also the preceding papers in various volumes of the *Monthly Notices*. The subject is really a very puzzling one.

"As regards stars only the map of 1870, and the map of 1871 have so much difference (not a great deal) that I conceive them to be certainly independent; and yet they have so much similarity as to give strong probability to their faithful representation of the visible objects. See in particular the line of four stars convex towards η *Argus*."

"These four stars have some agreement, not quite good, with four of Sir J. Herschel's. But other stars in the concavity of the bend are wanting in Sir J. Herschel's.

"* * * * I do concede to Mr. Abbott the merit of first pointing out that the nebula has shifted its position with regard to the star η *Argus*, and has changed its form materially, both which points I regard as certain. * * * * *

"Allow me to suggest that papers of this kind ought to be preserved more carefully. Mr. Abbott's maps were crimped up till I could not read them. I have flattened them, and will endeavour to persuade Mr. Dunkin to keep them flat."

In the first paper referred to from Lieut. Herschel and Sir W. F. Herschel, page 83, line 21, the former repudiates his own observations as follows :—

"You know how difficult it is to represent faithfully one's impression of a nebula by a hurried pencil drawing, and will understand that the accompanying copy (based on all) has no pretension to accuracy. *In fact it is a wretched attempt.*"

On comparing drawings Nos. 1 and 2 by Lieut. Herschel, although both were taken about the same time, it would be extremely difficult to recognise them as applying to the same object. The last two plates, 4 and 5, are by Sir John Herschel, as noted, semi-reversed by being pricked off from his engraving of 1834, or Cape observations.

Now, if we apply to this mode of procedure the article in the *Astronomical Register*, by G. F. Chambers, on July 7th, 1866, it will appear difficult to reconcile its authority :—

"SIR JOHN HERSCHEL'S DRAWINGS OF NEBULÆ.

"To the Editor of the *Astronomical Register*.

"Sir,—I have lately made a discovery which, whether it be really such or no, at any rate has not, so far as I am aware, ever been pointed out. *All Sir J. Herschel's drawings of Clusters and Nebulæ are represented as they cannot be seen.* The way this has come about appears to be as follows :—The sketch is placed on paper in exactly the position which the object has in the (inverting) telescope. This sketch is copied on to the copperplate also exactly as it stands on the paper, and the result is that when the paper is printed the picture is reversed right and left. The inconvenience of this plan is manifest as concerns observers working with the telescope, and seeking to make comparisons between what they see and what Sir John indicates that he saw ; but worse than all this, Lord Rosse and, so far as I have noticed, all other celestial draftsmen, adopt the common-sense plan of making their drawings to show exactly as the telescope shows, consequently other sketches placed in juxtaposition with Sir J. Herschel's wholly mystify and delude the reader ; indeed I am free to confess that I have myself thus been taken in. More than once have I sought in vain to reconcile the engraving of the nebula in Orion, appended to Herschel's *Outlines of Astronomy*, with the original viewed in an ordinary inverting telescope. Fortunately for me, I only copied into my book a limited number of Herschel and Rosse sketches, but in Guillemin's book Sir John's device leads to a far more serious amount of confusion.

"I am, Sir,
"Your obedient servant,
"G. F. CHAMBERS."

"Sydenham,
"July 7th, 1866.

In some of my early papers I have given an opinion that no two very dissimilar telescopes will show nebulous matter alike; take, for instance, the nebulæ as portrayed by the Earl of Rosse with those of Sir J. Herschel, and compare them together with the drawings of G. P. Bond. The instruments used by these observers respectively were a 56 feet reflector, with 6 feet speculum; a 20 feet reflector; and an achromatic of 22 feet 6 inches in length, with an object glass 15 inches in diameter. The difference between them leads to much confusion in Guillemin's fine book of the heavens. I have also a strong opinion that the variations in the position of this fluctuating object will have more or less effect in the sketches made of it at different times.

The Astronomer Royal takes exception to my drawings on the ground of inaccuracy in points of geometry. If Mr. Le Seur's opinion that the star η shines with the light of burning hydrogen, and has consumed the nebula, is thought to be correct; or, if the communicated opinions of Dr. Halley and the late two Herschel's that a nebula may concrete into individual stars, are of any account, how can geometry be applied to the object under consideration without certain fixed points?

An elaborate paper, with a drawing, has been prepared by H. C. Russell, Esq., B.A., the Government Astronomer of New South Wales, and read at a meeting of the Royal Society of that colony, which I lay on the table. Mr. Russell, while doing full justice to the object with the Sydney telescope, has given due credit to the observations previously made at Hobart Town.

If the Astronomer Royal had offered some opinion as to the cause of the fluctuations of this extraordinary and interesting object it would have been a boon to physical astronomy.

As regards the accuracy of the Hobart Town drawings I can refer to Mr. Piguenit, of the Survey Department, who is now present, by whom they were checked and confirmed previous to their transmission to the Royal Astronomical Society.

The following is a reply to the notes and queries made by the Astronomer Royal on the "Observations of η Argus and its nebula." Monthly Notices, R.A.S., for June 9th, 1871, pp. 233 and 234:—

"Note 1.—See in particular the line of four stars convex towards η Argus.

"These stars have retained their apparent position, &c., more than any others in the same object, although variations to a small degree have taken place. In carefully looking over the drawings it will be found that a similarity exists in the position of many of the stars, but as a rule some changes have taken place.

"In regard to the use of geometry it was never my intention to apply it, but only to sketch the object as an eye draft, and by adopting the term 'line of sight,' it was intended to simplify by always observing the object in one position, *i.e.*, the telescope lying in a direct line W.N.W. to E.S.E. (the drawing being reversed), and at an angle of from 70° to 80° above the horizon, according to the state of the atmosphere at the time, *and in this line of sight* all the drawings have been made; and in an easy sitting position, with the light shaded from everything but the paper, the object has always been carefully delineated.

"With regard to 'all the stars agreeing with either Sir John, or Lieut. Herschel's configuration,' I never expected they would, as apparent changes have more or less constantly been taking place.

"The question asked in No. 7, 'the drawing (Lieut. Herschel's) had undoubtedly reached Australia, has Mr. Abbott copied it?' I answer no! The whole of my drawings were made previous to, and independent of any others.

"In making comparisons it would be desirable to refer to the original drawing, as in the lithographs, which are on a reduced scale, some trifling inaccuracies occur."

[Sent October 7th, 1871, to the Hon. Secretary, R.A.S., and to Mr. R. A. Procter, together with the plates and paper read before the R. S. of Tasmania.]

METEOROLOGY.

MARCH, 1871.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced. Highest.	Lowest.	Self-Registering Thermometers. Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot.	Rain in inches.
	In.	In	°	°	°	°			
							NW	1·30	

egisters, and not from the maximum
a height of 192 feet and the force
a uniform velocity during the month
roximately correct.
different winds are registered each
a from the average.

The Meteorology for January and February, 1871, was by mistake bound up in the Proceedings for 1870.

Day of Month.	Highest.	Lowest.	Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	Rain in inches.
14	29·684	29·606	75	56	108·5	54·5	NW	·78	
15	30·167	29·984	68	50	110·5	42·0	SE	1·30	
16	30·339	30·319	73	52	107·0	50·0	NW E NE	·78	
17	30·338	30·238	62	51	69·5	49·5	NE E NE	·26	
18	30·150	30·013	64	52	85·0	50·0	SW NW SE	·78	
19	29·937	29·815	64	47	96·0	46·0	NW S SW	0·	0·22
20	29·782	29·734	63	50	95·0	50·0	SW SE	1·04	0·16
21	30·034	29·995	62	46	96·0	42·0	SW NW	1·04	
22	30·176	30·102	58	46	89·0	43·5	SE	1·60	
23	30·186	30·126	61	40	91·0	37·5	NW SE	·52	
24	29·987	29·905	72	49	102·0	46·5	SE NW	·52	
25	30·042	29·899	73	49	109·0	48·5	SW SE	1·04	
26	30·248	30·219	74	41	108·5	38·5	NW SE	1·30	
27	30·291	30·123	85	45	118·0	45·5	NW SE	3·12	
28	30·083	28·887	88	48	120·0	50·0	NW	1·04	
29	29·679	29·593	81	56	110·0	56·0	NW W NW	5·47	0·13
30	29·876	29·685	61	49	93·0	44·0	NW SW	·78	0·02
31	30·083	30·012	74	46	113·5	42·5	SW SE	1·04	
Monthly mean 29·978			60·00		101·90	46·53	Total Force ..	46·30	1·33

The mean in all cases is taken from the
and minimum.
The direction of the wind is registered
according to Lind's Wind Gauge. The
is a very arbitrary one, and the results
The relations of the quantities of rain
evening at sundown.
The 25 years' standard tables are used fo

Leafing, Flowering, and Fruiting of a few standard plants in the Royal Society's Gardens during the month.

14th.—Tips of hornbean commencing to turn yellow.
16th.—Coe's golden drop plum ripe.
18th.—Tips of elm turning yellow.
20th —Seckle pear commencing to ripen.
24th.—Leaves of horse chestnut turning brown.
25th —Ash leaves commencing to fall.
26th.—Oak ditto.

Barometer mean, 29·978 in., being 0·123 in. above the average.
Temperature mean, 60·00°, being 0·24° above the ditto.
Solar intensity mean, 101·90°, being 1·39 below the ditto.
Dew point mean, 46·8, being 2·42 below the ditto.
Humidity of air mean, ·66, being ·05 per cent. below the ditto.
Elastic force of vapour mean, ·337, being ·019 per cent. below the ditto.

METEOROLOGY.

MARCH, 1871.

Private Observatory, Hobart Town.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		Rain in inches.
	Highest.	Lowest.	Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	
	In.	In	°	°	°	°			
1	29·774	29·554	69	52	99·0	44·5	NW	1·30	
2	29·665	29·586	68	53	97·0	50·5	NW SE NW	1·04	
3	30·001	29·848	64	42	102·5	40·5	NW SW	3·12	
4	30·252	30·186	63	50	101·0	49·0	SW SE	·78	
5	30·264	30·241	66	53	98·0	50·0	NW SE	·52	0·03
6	30·225	30·052	74	54	110·0	51·0	NW E SE	·78	
7	29·897	29·752	72	48	109·0	45·5	NW S	·52	0·09
8	30·010	29·962	72	48	109.0	46·0	NW SE	1·04	
9	30·042	29·752	74	45	111·5	43·0	NW SE	1·04	
10	29·815	29·587	69	50	105·5	48·0	SW	10·41	
11	30·094	29·890	59	48	90·0	45·0	NW SE	1·04	0·28
12	30·275	30·229	73	43	108·0	41·0	NW SE	1·60	
13	30·134	29·897	76	52	97·0	46·0	N NW	·78	0·40
14	29·684	29·606	75	56	108·5	54·5	NW	·78	
15	30·167	29·984	68	50	110·5	42·0	SE	1·30	
16	30·339	30·319	73	52	107·0	50·0	NW E NE	·78	
17	30·338	30·238	62	51	69·5	49·5	NE E NE	·26	
18	30·150	30·013	64	52	85·0	50·0	SW NW SE	·78	
19	29·937	29·815	64	47	96·0	46·0	NW S SW	0·	0·22
20	29·782	29·734	63	50	95·0	50·0	SW SE	1·04	0·16
21	30·034	29·995	62	46	96·0	42·0	SW NW	1·04	
22	30·176	30·102	58	46	89·0	43·5	SE	1·60	
23	30·186	30·126	61	40	91·0	37·5	NW SE	·52	
24	29·987	29·905	72	49	102·0	46·5	SE NW	·52	
25	30·042	29·899	73	49	109·0	48·5	SW SE	1·04	
26	30·248	30·219	74	41	108·5	38·5	NW SE	1·30	
27	30·291	30·123	85	45	118·0	45·5	NW SE	3·12	
28	30·083	28·887	88	48	120·0	50·0	NW	1·04	
29	29·679	29·593	81	56	110·0	56·0	NW W NW	5·47	0·13
30	29·876	29-685	61	49	93·0	44·0	NW SW	·78	0·02
31	30·083	30·012	74	46	113·5	42·5	SW SE	1·04	
Monthly mean 29·978			60·00		101·90	46·53	Total Force ..	46·30	1·33

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard **tables are used for obtaining the difference from the average.**

Leafing, Flowering, and Fruiting of a few standard plants in the Royal Society's Gardens during the month.

14th.—Tips of hornbean commencing to turn yellow.
16th.—Coe's golden drop plum ripe.
18th.—Tips of elm turning yellow.
20th —Seckle pear commencing to ripen.
24th.—Leaves of horse chestnut turning brown.
25th —Ash leaves commencing to fall.
26th.—Oak ditto.

Barometer mean, 29·978 in., being 0·123 in. above the average.
Temperature mean, 60·00°, being 0·24° above the ditto.
Solar intensity mean, 101·90°, being 1·39 below the ditto.
Dew point mean, 46·8, being 2·42 below the ditto.
Humidity of air mean, ·66, being ·05 per cent. below the ditto.
Elastic force of vapour mean, ·337, being ·019 per cent. below the ditto.

Total amount of rain, 1·33in., being 0·34in. below the ditto.
Increase of spontaneous evaporation on rain-fall, 2·00in.
Mean amount of ozone, 6·11, being 0·90 of chromatic scale below the ditto.
Electricity active on the 1st, 3rd, 4th, 10th, 22nd, 27th, and 28th.
Strong southern lights on the 23rd. Aurora Australis on the 24th.

FRANCIS ABBOTT.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE MONTH OF MARCH, 1871.

By E. Swarbreck Hall.

High atmospheric pressure, great daily variations of temperature, cloudy weather with deficiency of sunshine, small rain-fall, and paucity of ozone, have characterised the present month, and told heavily on old and feeble people, more than two-fifths of the mortality having fallen on persons at and above sixty years old.

Atmospheric pressure mean, 29·978, was + ·123 above the 25 years' average. The maximum, 30·339, was on the 16th; the minimum, 29·554, on the 1st. The extreme range of the month, therefore, was small, only ·785. But the daily fluctuations were very great, 18 days having more than one-fifth of an inch, and one of them, the 15th, a rise of + ·521 in the 24 hours.

Wind-force total, 46·30 lbs., was—6·79 lbs. below the average. *North West* winds were more numerous than from any other points of the compass, but were below the average in strength. *North, North East*, and *East* were both few in number and trifling in force. *South East*, our most propitious wind, was largely over the average both in number and force. *South* was below the average in both aspects. *South West* winds were about three times more than the average in number, and double in force. *West* was only recorded once, but with the strength of 5·21 lbs. pressure to the square foot. Only one other wind of the same force was recorded, and that a *South West* one. *Calms* were 25, being — 3·22 less than the average.

Temperature mean, 60·00 degrees, only varied from the 25 years' average by + 00·24. The highest record was 88 degrees on the 28th, nine years out of the 25 having a higher maximum. The lowest temperature, 40, was on the 23rd, only five years in the 25 having lower minima. The *wet bulb* mean was 53·56, being 00.39 below the average.

Daily-range of temperature exceeded the average by +1·44, being 20·84 degrees. The greatest range in 24 hours, 40 degrees, occurred on both the 27th and 28th. These fluctuations of temperature, combined with high atmospheric pressure, are very trying to diseased, feeble, and aged persons, though young and healthy people are little affected by them.

Solar-intensity mean, 101·90, was —1·39 less than the average. The maximum was 120 degrees on the 28th, which has often been exceeded.

Terrestrial-radiation mean, 46·53 degrees, was —1·62 below the average. The minimum record was, for the night of the 23rd, the temperature being, 37·5 degrees. Only thrice before in 15 years have there been lower minima in March.

Elastic-force of vapour 337 was—19 below the average; ranging from 126 at noon on the 28th, to 522 at noon on the 14th.

Humidity mean, 66, was —5 below the average.

Rain-fall, 1·33 inches, was —·34 below the average. It fell on eight days, being —1·09 less than the average. It was sufficient to flush water courses and drains on the 11th, 13th, 19th, 20th. During the four months past, December, January, February, March, the rain-fall has only amounted to 4·48 inches, being —1·97 inches less than the 25 years' standard mean. *Snow* never was visible from the city, on Mount Wellington, during the month.

Spontaneous-evaporation was 3·33 inches.

Cloud mean, 6·06, was + ·64 above the average.

Ozone mean, 6·11, was—·90 below the average, and the smallest on record for the month of March.

Electricity. 14 positive with tension from 3·5 to 6 were recorded; negative 46 with tension from 2 to 6, and 2 "nils." The *Aurora Australis* was seen on the nights of the 23rd and 24th. There was *thunder* with rain on the 29th.

The *deaths* during the month were 51, being—3 4·14ths less than the average of the preceding 14 years, though +4 more than March 1870 and +9 more than 1869 had. In 1861 the deaths were the same in number, but in every other year of the fourteen more; the range being from 42 in 1869 to 73 in 1864. Thirty (30) were males, 21 females. Under one year old there were 11 deaths; from 1 to 5 the deaths were 4; none between 5 and 10; one (1) from 10 to 15; one (1) from 15 to 20; from 20 to 60 there were 13; and from 60 to all ages above 21, the oldest being 92, an old Waterloo soldier who died at the Brickfields Invalid Asylum. The deaths in the General Hospital were 13, seven (7) of which were from other Registration Districts, and one a foreign sailor. At the *Cascades Invalid Asylum* there were 5 deaths, at the *Brickfields* 2. There were 3 *inquests.* One died one hour after admission into hospital from a *tumour of the liver*; another died there from *compound fracture of both bones of the leg*, which occurred at Brighton. The leg was amputated; the third died before he reached the hospital from *inflammation of the bowels*, having been brought down the long and torturing journey from the Lakes. It is high time that cottage hospitals should be established by the settlers in their respective districts to avert such sufferings as this poor man must have endured. *Zymotic diseases* caused 13 deaths mostly from bowel complaints, but no epidemic disease prevailed. *Consumption* caused 4 deaths, none of the deceased having been natives of Tasmania.

APRIL, 1871.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		Rain in Inches.
	Highest.	Lowest.	Highest in shade.	Lowest in shade	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	
	In.	In.	°	°	°	°			
1	30·191	30·153	75	45	113·0	45·5	NW SW SE	1·04	
2	30·191	30·105	77	45	115·0	42·0	NW N SE	1·04	
3	30·177	30·148	74	48	100·5	48·0	NW NE SW	·78	
4	30·217	30·125	63	54	67·0	52·5	NW SE	·78	
5	30·178	30·115	69	53	100·0	52·0	SW SE W	·52	
6	29·126	30·085	74	48	105·0	44·0	NW NE SE	·26	
7	30·005	29·813	67	45	95·5	43·0	NW	·26	
8	29·940	29·844	69	50	101·0	45·0	NW W NW	1·04	
9	29·932	29·850	68	50	96·0	50·5	NW	7·80	
10	29·824	29·647	74	55	104·5	52·0	NW	5·72	
11	29·963	29·834	71	48	102·5	46·0	NW SE W	1·04	
12	29·948	29·565	62	42	65·0	39·0	NW	3·38	0·10
13	29·598	29·499	62	43	87·0	38·5	W NW SW	7·80	0·62
14	30·189	30·011	59	43	91·0	37·0	SW SE	5·72	
15	30·260	30·251	68	38	95·0	37·5	SW NW	·52	
16	30·278	30·184	68	40	99·5	36·0	NW SE	·52	
17	30·203	30·135	70	41	91·0	40·5	NW SE	·78	
18	30·165	30·055	71	44	101·0	43·0	NW	·52	
19	29·907	29·679	79	48	105·5	47·0	NW W	5·63	
20	30·279	29·942	61	47	95·0	46·0	SW SE	·78	0·06
21	30·464	30·378	71	45	99·5	43·0	NW SE	1·04	
22	30·174	29·979	66	41	93·0	40·0	NW NE	·78	
23	29·735	29·614	65	50	84·0	49·0	NW	5·73	
24	29·860	29·664	67	45	92·0	43·5	NW	2·36	0·10
25	29·824	29·693	64	45	88·0	44·0	NW	3·64	
26	29·907	29·832	66	50	72·5	48·5	NW	·78	
27	29·980	29·879	78	53	105·0	51·0	NW W	1·30	
28	30·115	30·015	68	51	70·0	48·0	W SW	1·30	
29	30·345	30·304	68	42	97·5	39·0	NW NE SE	·52	
30	30·361	30·330	57	44	64·0	40·0	NW NE	0·	
Monthly mean	30·019		58·36		90·32	44·37	Total force	73·38	0·86

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month of April, 1871.

12th.—Coe's late red plum ripe.
15th.—Leaves of common elm falling.
20th.—Chinese chrysanthemum commencing to flower.
22nd—Leaves of mountain ash commencing to fall.
25th.—Seeds of Carpinus betulus ripe.
28th.—Leaves of black mulberry commencing to fall.

Barometer mean, 30·019in., being 0·128in. above the average.
Temperature mean, 58·36°, being 3·33° above the average.
Solar intensity mean, 90·32°, being 1·49° below the average.
Dew point mean, 46·6°, being 0·51 below the average.
Humidity of air mean, ·67, being ·09 per cent. below the average.
Elastic force of vapour mean, ·323, being ·002 per cent. below the average.
Total amount of rain, 0·86in., being 0·92in. below the average.
Increase of spontaneous evaporation on rain fall, 2·58in.
Mean amount of ozone, 6·47, being 0·52 of chromatic scale below the average.
Electricity active on the 6th, 8th, 9th, 10th, 11th, 12th, 14th, 15th, 20th, 21st, 24th, 25th, 27th, and 29th.
Mount Wellington covered with snow on the 12th.
Strong Southern Lights on the 24th.

FRANCIS ABBOTT.

V.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE MONTH OF APRIL, 1871.

BY DR. E. SWARBRECK HALL.

This month though unusually mild as to temperature, and with great aerial movements, was characterised by high atmospheric pressure, wide daily range of temperature, defective rain-fall, &c. The deaths were much below the average, and with a very equable distribution as to age, but a most unparalleled inequality of the sexes, females exceeding males in the proportion of 16 to 12.

Atmospheric pressure mean, 30·019, exceeded the 25 years' standard average by + ·128. On ten days the variations exceeded one-fifth of an inch, the maximum, a rise of + ·646, having occurred on the 14th. Nevertheless the range for the whole month was only ·965 of an inch, the maximum being 30·464 on the 21st, minimum, 29·499, on the 13th.

Wind-force amounted in the aggregate to 73·38lbs., being + 26·70 above the average. *North-west* winds were recorded 51 times out of the 90, with a force of 41·38lbs. On four days these winds partook of the character of *hot-winds* though in a subdued form. *West* winds were unusually frequent and strong. On the 19th one was registered as exercising a pressure of 10·42lbs. to the square foot, the maximum of the month. *South-west* to were more numerous and stronger than common; no *South* winds were recorded; *South-east* were only 13 in number with a total of 4·94lbs. force; no *East* winds; *North-east* 5 in number, only ·78 of a lb. in force; one *North* wind ·26 of a lb. strength.

Temperature mean, 58·36 degrees, was + 3·33 above the April average. The years 1855-6-7, only, out of the 30 years recorded, had a higher mean. The maximum was 79 degrees on the 19th by the self-registering thermometer, lent 80 by the observed thermometer at one p.m. There was a strong hot-wind on that day. The April maximum has often been higher than this. The minimum, 38, was recorded for the night of the 15th. It has often been lower in previous Aprils. The *wet bulb thermometer* mean was 52·11 degrees, being + 1·02 above the average.

Daily range of temperature mean, 21·93 degrees, was + 4·71 above the average. The highest recorded was 32 degrees on the 2nd.

Solar intensity mean, 90·32 degrees, was —1·49 less than the average, which may be accounted for by the excess of cloudy days. The maximum was 115 degrees on the 2nd.

Terrestrial radiation mean, 44.37 degrees, was —1·30 above the average, the minimum was 36 degrees in the night of the 16th.

Elastic force of vapour mean, 323, was —2 less than the average; it ranged from minimum 215 in the morning of the 14th to maximum 545 at noon on the 19th.

Humidity mean, 67, was —9 below the average.

Rainfall amounted to only ·86 of an inch, —92 of an inch below the April average —·62 of an inch fell in one day, the 13th. Only 4 wet days were registered, being —7·82 less than the average. Though almost all the meteorological phenomena of this month were widely different from those of April, 1870, in no one was the contrast greater than in rainfall. In that month there were 13 wet days with an aggregate amount of 4·25 inches. *Snow* appeared on Mount Wellington on the 12th, 13th, and 14th.

Spontaneous evaporation was 3·38 inches, a great excess over rainfall, as was sure to be the case with so much wind and warmth.

Cloud mean, 6·26, was + ·52 above the average.

Ozone, mean, 6·47, was —·52 only below the average. Saturation (10) was registered on the mornings of the 14th and 25th. A much greater deficiency of ozone might have been expected with such a prevalence of the anti-ozonic winds from the north-west, and the very dry character of the month.

Electricity was indicated by the electrometer for all the 60 observations during the month, 12 of the records being "positive" with tension from 4 to 7·5; the other 48 "negative" with tension from 2·5 to 7·5.

Deaths.—Only 28 persons were registered as dying during this month, though another is known of, but not yet registered as the law requires. The average April deaths for the previous 14 years is 42 12-14th, ranging from 27in. 1869 to 54 in 1864. No year had less than 34, but the present one and 1869. Under one year of age there were 5 deaths; from 1 to 5 one death; from 5 to 10 the deaths were 3; from 10 to 15 one death; from 15 to 20 one death; from 20 to 60 the deaths were 8; and at 60 and all ages above, 9, the oldest being 88 years old. So equal a distribution in the various groups of ages is a very rare occurrence. 12 only were males, 16 females, the disparity of the sexes being usually just the reverse. No epidemic disease was prevalent, and in all the *Zymotic class* there were only 2 deaths, from *diarrhœa*, aged 5 weeks and 15 months respectively. *Consumption* caused 4 deaths, one a native of Tasmania, the rest born in England, Ireland, and Scotland repectively. The last was only a visitor for health from Ceylon. The public *Hospital* had only 3 deaths, one of which came from another registration district, another was from *burns* on which an *inquest*, the only one in the month, was held. At the *Brickfields Male Invalid* establishment there was only one death, but at the *Cascades* there were 5.

MAY, 1871.

PRIVATE OBSERVATORY, HOBART TOWN.

	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		
Day of Month.	Highest.	Lowest.	Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	Rain in Inches.
	In.	In.	°	°	°	°			0·0
1	30·182	30·013	63	51	66·0	50·0	SW NW	0·	0·07
2	29·826	29·715	62	53	75·0	52·0	NE NW N	0·	0·01
3	29·789	29·779	61	50	70·0	39·0	SE S	0·	0·02
4	29·922	29·800	62	43	95·0	41·5	SE SW SE	·52	
5	29·960	29·937	55	44	86·0	42·0	NW N E	0·	0·04
6	30·018	29·979	57	45	68·5	42·5	NW E SE	0·	
7	30·070	30·037	56	43	58·0	40·0	NW SE	·26	0·03
8	30·110	30·090	53	48	57·0	44·0	SE	1·04	0·05
9	30·227	30·147	53	45	59·5	43·5	SW SE	·52	0·04
10	30·197	30·186	54	45	63·0	41·5	SE	0·	
11	30·191	30·147	53	50	59·0	47·0	SE	·78	
12	30·160	30·134	59	48	86·0	42·0	NW SE NW	0·	
13	30·136	30·062	62	42	87·0	35·0	NW SW	·52	
14	30·070	30·042	63	34	85·5	33·0	NW SE	1·04	
15	30·061	30·020	65	38	90·0	35 5	NW	1·30	
16	30·034	30·010	64	50	89·0	48·0	NW NE	·78	
17	30·182	30·140	64	40	83·0	37·5	SE NE NW	·78	
18	30·266	30·146	62	36	80·5	34·5	NW W	·78	
19	30·247	30·215	67	40	91·5	38·0	NW W	·52	
20	30·262	30·233	73	40	98·5	38·0	NW SW NW	·78	
21	30·309	30·272	75	43	100·0	41·0	NW SE	·26	
22	30·369	30·347	71	47	97·0	40·5	NW SE	·52	
23	30·384	30·333	57	49	59·5	45·0	NW	0·	
24	30·386	30·328	56	50	58·0	44·0	NW	0·	
25	30·363	30·330	56	38	66·5	36·5	NW	·26	
26	30·203	30·099	61	43	86·0	43·0	NW	1·04	
27	29·990	29·845	63	49	76·0	48·0	NW E	0·	0·05
28	29·748	29·685	60	43	88·0	41·5	NE SW W	·52	0·08
29	29·495	29·413	53	41	75·0	39·0	NW	·52	0·25
30	29·903	29·824	50	40	78·0	33·0	W SW NW	2·86	0·02
31	30·095	30·065	70	45	95·5	42·5	NW	1·30	
Monthly mean 30·071			52·98		78·31	41·15	Total force	16·44	0·66

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month.

12th.—Medlar commencing to ripen.
18th.—Coronilla glauca commencing to flower.
20th.—Photinia serrulata ditto ditto.
24th.—Diosma alba ditto ditto.
25th.—Spirea prunifolia ditto ditto.
26th.—Ailanthus glandulosus leaves all fallen.

Barometer mean, 30·071in., being 0·224in. above the average.
Temperature mean, 52·98°, being 2·70° above the ditto.
Solar intensity mean, 78·31°, being 3·56° below the ditto.
Dew point mean, 45·0°, being 1·52° above the ditto.
Humidity of air mean, ·78, being ·02 per cent. above the ditto
Elastic force of vapour mean, ·311, being ·009 per cent. above the ditto.
Total amount of rain, 0·66in., being 1·15in. below the ditto.
Increase of spontaneous evaporation on rainfall, 0·60in.
Mean amount of ozone, 5·36in., being 1·44 of chromatic scale below the ditto.
A small amount of electricity all through the month.

The early part of the month was notable for a large amount of cloud, and a frequent register of calms, with dewy mornings, and low vapour.

Snow on the apex of Mount Wellington on the 29th.

On the 30th the mountain and low hills were capped with snow. FRANCIS ABBOTT.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE MONTH OF MAY, 1871.

By Dr. E. Swarbreck Hall.

The character of the weather during the month was in almost every aspect abnormal. Very high atmospheric pressure, very calm, very mild, very cloudy, little rain, little ozone, little sunshine, little electricity. The deaths were considerably below the average of the previous 14 years, falling principally upon aged and infirm people, nearly one-half of the deaths being at and above 60 years old, the oldest 84. Under 20 the deaths were remarkably few.

Atmospheric pressure mean, 30·071, was + ·224 above the 25 years' adopted standard mean. Only three Mays in the previous 30 years have had higher means. The maximum was 30·386 on the 24th; the minimum, 29·413, on the 29th, the month's range consequently ·973 of an inch. The greatest movement in any 24 hours was a rise of + ·389 of an inch on the 30th. On only 7 other days did it exceed one-fifth of an inch. Steady high barometrical pressure with moderate fluctuations, and small extreme range, characterised this month.

Wind force, 16·64 lbs, was —21·21 lbs. below the May average. *North-west* winds were recorded 48 times out of the 93 observations, and had 10·66 lbs, of the total force. The strongest wind had only 2·60 lbs. pressure to the square foot; it occurred on the 30th, and was from the north-west. *Calms* were 52 in number being +9·20 above the average.

Temperature mean, 52·98 degrees, was +2·70 above the average. Only four Mays, out of the previous 30, had a warmer mean. The maximum was 75 degrees on the 21st. The minimum 34 on the 14th. *Wet-bulb* mean was 49·30, being +2·22 above the average.

Daily Range of Temperature had the mean of 16·32 degrees, being +1·16 above the average. The greatest on any day was 33 degrees on the 20th.

Solar Intensity mean, 78·31 degrees, was —3·56 below the average, owing no doubt to the cloudy character of the month. The maximum was 100 on the 21st, the minimum 57 on the 8th.

Terrestrial Radiation mean, 41·15, was +1·84 above the average. The lowest was recorded for the night of the 30th, being 33 degrees. Often before has it fallen below freezing point (32.)

Elastic force of Vapour mean, 311, was + 9 above the average. It ranged from 503 on the 2nd, to 197 on the 15th.

Humidity mean, 78, was + 2 above the average.

Rainfall ·66 of an inch, was—1·15 below the average. May 1870 was almost the same. It fell on 11 days, being —3·09 below the average. On only one day, the 29th, did sufficient (·25) fall to cleanse the surface channels. *Snow* covered Mount Wellington and all the low hills about the city on the morning of the 30th.

Spontaneous evaporation was 1·26 inches.

Cloud Mean, 6·68, was + 1·18 above the average. At 35 out of the 93 records the sky was entirely over-clouded.

Ozone Mean, 5·36, was—1·44 below the average. No previous May record had so small an amount.

Electricity was almost confined to negative of a low tension, ranging from 1 to 5. There was only one positive with tension of 4. There were 7 nils. No thunder heard or lightning seen during the month.

The *deaths* during the month were 33 being—7 6-14 less than the average of the previous 14 years, and—6 less than May 1870 had. Again the female deaths, 17 out of 33, preponderated. Under one year old there were 3 deaths; from 1 to 5, also 3; from 5 to 10, none; from 10 to 15, one; from 15 to 20, none. In May 1870 there were 12 deaths under 20 years old. From 20 to 60 the deaths were 10; and at 60 and all ages above the large proportion of 16, the oldest being 84 years old. May 1870 had 17, the oldest being 90. In the *zymotic class* of diseases there were only 2 deaths from erysipelas; one an old man from a country district, the other a child only 2 years old. From *consumption* there were 2 deaths, one a woman aged 50, a native of Switzerland, the other a girl of 14, daughter of a coal miner from the coal mines, Tasman's Peninsula, born in Tasmania. Her mother and a sister both died from the same disease in Hospital some time before, so that probably the hereditary tendency in the family is strong. In the public *Hospital* there were 6 deaths, inclusive of the girl from consumption. At the *Cascades* there were 5 deaths, three females aged 60, 74, 75, and two males aged 71 and 81. At the *Brickfields* there was only one death, a man aged 72. There was only one *Inquest*, a man aged 75 who died from natural causes.

JUNE, 1871.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced. Highest.	Lowest.	Self-Registering Thermometers. Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Wind. Direction from three daily registers.	Force in lbs. per square foot.	Rain in inches.
	In.	In.	°	°	°	°			
1	30·172	30·121	68	35	90·5	32·5	SW NW	1·30	
2	30·132	30·110	71	51	95·0	50·0	NW	·78	
3	29·887	29·821	62	51	72·0	47·5	NW	1·56	
4	30·129	30·066	66	40	90·0	35·5	NW E SE	·78	
5	30·264	30·220	56	37	72·5	34·0	NW W	·26	0·02
6	30·363	30·299	61	40	88·0	35·5	NW E SW	0·	0·22
7	30·172	30·048	52	36	73·5	34·0	NW N SE	0·	
8	29·930	29·872	58	33	80·5	32·0	NW	·78	
9	29·916	29·872	61	38	89·0	39·5	NW SE SW	1·04	
10	29·697	29·606	54	35	75·0	32·0	NW	1·30	0·01
11	29·950	29·887	62	40	85·5	37·5	NW	1·30	
12	30·006	29·956	64	42	91·0	39·5	NW	·26	
13	29·894	29·737	58	40	81·0	36·5	NW	·52	0·02
14	29·790	29·608	57	46	65·0	44·0	NW	·52	
15	29·948	29·924	62	44	89·8	44·0	NW	1·04	0·13
16	30·069	30·029	65	37	85·5	34·0	NW SW	1·04	
17	29 972	29·914	60	37	94·0	34·0	NW SE	·52	
18	30·097	29·961	56	37	70·0	32·0	NW E SE	0·	0·02
19	30·198	30·184	54	46	63·0	40·5	SE	1·04	0·03
20	30·269	30·250	53	45	60·5	42·5	SE	·26	0·07
21	30·305	30·297	51	42	55·0	39·0	NW SE	0·	0·01
22	30·274	30·248	52	35	75·0	32·0	NW	·26	
23	30·142	29·992	59	36	81·5	32·0	NW	1·56	
24	29·664	29·382	61	38	84·0	35·5	NW	3·38	0·02
25	29·637	29·560	64	36	87·0	33·0	SW NE SW	·78	
26	29·719	29·613	62	35	76·5	32·0	NW	·78	0·05
27	29·428	29·311	61	46	81·0	45·0	NW	1·30	0 15
28	29·784	29·711	58	41	80·0	41·5	SE NW	1·30	
29	29·806	29·53	63	43	81·0	39·0	NW	·52	0·03
30	29·593	29·44	63	47	83·0	44·0	NW SW	1·56	0·07
Mean monthly	29·925		50.41		80·28	37·67	Total Force ..	25·48	0·55

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.
The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.
The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.
The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month of April, 1871.

16th.—Maclaura aurantiaca leaves all shed.
17th.—Common privet ditto.
28th.—Black mulberry ditto.

Note.—The early narcissus, snow-flake, and pyrus japonica, which were in flower last year, on the 15th, 20th, and 24th respectively, have not yet flowered this year, being retarded, probably, by the unusually dry state of the ground.

Barometer mean, 29·925in., being 0·044in., above the average.
Temperature mean, 50·41°, being 3·66° above the ditto.
Solar intensity mean, 80·28°, being 5·34° above the ditto.
Dew point mean, 41·8°, being 0·56° above the ditto.
Humidity of air mean, ·77, being 7 per cent. below the ditto.
Elastic force of vapour mean, ·279, being ·010 per cent. above the ditto.
Total amount of rain, 0·55in., being 1·28in. below the ditto.
Increase of spontaneous evaporation on rainfall, 0·56in.
Mean amount of ozone, 6·13, being 3·37 of chromatic scale below ditto.
Electricity feeble all through the month.
The apex of Mount Wellington covered with snow on the 10th and 28th.
Strong Aurora Australis on 11th. FRANCIS ABBOTT.

X.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE MONTH OF JUNE, 1871.

BY DR. E. SWARBRECK HALL.

This month has been more than usually fatal to persons above 15 years old, and the mortality very small indeed to all under that age. The weather was altogether abnormal, though very pleasant. This is the first month in 1871 in which the death-rate has exceeded the average of the previous 14 years.

Atmospheric-pressure mean, 29·925 was + ·44 above the 25 years' average. The extremes were, maximum, 30·363, on the 6th; minimum, 29·311, on the 27th, being an extreme range for the whole month of 1·052 inches. This was considerably exceeded in June, 1870, though the average height of the barometer was less. On ten days the range exceeded one-fifth of an inch, the 24th having a fall of more than half an inch, *i.e.*—·580.

Wind-force total, 25·48 lbs., was only + ·98 above the average, but *north-west* winds, the least favorable to health, had 64 out of the 90 observations, with 20·54 lbs. of the strength. All the winds from the other seven points of the compass were much below their average both in frequency and force. The strongest wind, a north-west on the 24th, had only a pressure of 2·60 lbs. to the square foot.

Temperature mean, 50·41 degrees, was + 3·66 above the 25 years' average, and nearly two degrees warmer than June 1870 was. Only two Junes in the previous 30 years had a higher mean, *i.e.*: 1861 being 50·92, and 1867 51·64. The extremes were 71 on the 2nd about noon, and 33 in the night of the 8th. The maximum was twice exceeded in the previous 30 years, the minimum was less in thirteen out of the 30 years. The *wet-bulb thermometer* mean was 46·53 degrees, being + 2·08 above the 20 years' average.

The daily range of temperature was the most abnormal meteorological phenomenon of this month, the mean being 19·83 degrees, which is + 4·79 above the 25 years' average. Only four out of the previous 30 years' Junes had a higher mean. Last year's daily range mean was nearly six degrees less. The greatest range in any twenty-four hours was 33 degrees on the 1st, but on 14 other days the range exceeded 20 degrees between the extreme heat of the day by the self-registering shade maximum thermometer, and the self-registering minimum thermometer in the night. To these extreme variations of temperature was no doubt owing the excessive death-rate in feeble, diseased, and aged persons, and the great prevalence of diseases of the respiratory organs, catarrh, bronchitis, and pneumonia. No doubt, however, the dry state of the air, and the great elastic force of vapour, tended also to the same result. External warmth by fires and good bedding (not from over crowding) is essential at such times to preserve life in aged, diseased, and feeble people, together with warm nutriment in the long and trying interval between the evening and morning meals. The Registrar-General of England emphatically notices in his reports the greatly augmented death-rate in old and ailing persons that accompanies a sudden and extensive fall of temperature.

Solar Intensity mean, 80·28 degrees, was + 5·34 above the average, and more than four degrees higher than in June 1870. Only June 1856 exceeded the present month. The maximum was 98 degrees on the 15th, being the highest in our records. This extreme warmth of sunshine is the more remarkable, because the cloudy days were above the average.

Terrestrial-radiation mean, 37·67 degrees, was only + 1·04 above the average. The minimum, 32 degrees (freezing point), was noted for the nights of the 2nd, 8th, 10th, 18th, 23rd, 26th. To be exposed, as many persons are, to the extremes of the sun's heat by day, and this cold by night, a variation of 66 degrees, must be trying to the strongest constitutions, and lethal to weak ones.

Elastic force of vapour mean, 279, was + 10 above the average. It ranged from minimum 175 on the morning of the 8th, to maximum 456 at noon on the 29th.

Humidity mean, 77, was — 7 below the June average.

Rain fell on 14 days, which is + 2·36 above the average, but the quantity was too trifling on any day but the 27th to make the channels run. The total was only ·55 of an inch, being — 1·28 inches below the average. The three Junes, 1852-3-4, were the only ones in the previous 30 years with less rain-fall than the present month. But every month now for the last seven months has had less than the average rain-fall; altogether for the first half of this year the deficit of rain amounts to 4·14 inches. *Snow* remained on Mount Wellington on the 1st of the month, and received a slight addition on the 11th, and a copious addition on the 28th.

Spontaneous Evaporation amounted to 1·11 inches.

Cloud mean, 6·10, was + ·59 above the average.

Ozone mean, 6·13, was — ·37 below the average. Saturation (10) was recorded twice.

Electricity was feeble, only 3 positive with tension from 3·5 to 5. Negative 50 tension 1 to 5. "Nils" 7.

The Deaths were 51, being + 5 2-14ths above the average of the previous 14 years. Only four out of the fourteen had a greater number of deaths, the highest being 1861 with 59. 36 were males, only 15 females. Under one year there were 4 deaths; from 1 to 5 there was only one death; from 5 to 10 no deaths; from 10 to 15 one death; from 15 to 20 there were 4. Ten deaths only under 20 years old out of 51 at all ages, is a very small proportion indeed. From 20 to 60 there were 20 deaths; and at 60 and all ages above, the oldest being 94, there were 21 deaths. The *Zymotic* class of diseases had only 3 deaths, two from *Diarrhœa*, one "*English Cholera*." There were 4 deaths from *Pneumonia*, being an unusually large number. *Consumption* caused 6 deaths, four of them Tasmanians by birth, one Englishman, and the 6th a native of New South Wales on a visit for change of climate. The deaths in *Hospital*, including inquest cases, were unusually large, 17. At the *Brickfields* Male Invalid Asylum, there were 2 deaths, aged 68 and 94; at the Cascades there were 4 deaths, three males, one female, respectively aged 58, 68, 70, 73. The *Inquests* were 5, four of them in connection with the gaol for males, one having died there, and three in Hospital shortly after being removed from the gaol.

JULY, 1871.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		Rain in Inches.
	Highest.	Lowest.	Highest in shade.	Lowest in shade	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	
	In.	In.	°	°	°	°			
1	29·772	29·740	56	43	82·0	34·0	NW	1·30	0·68
2	29·584	29·426	53	40	75·0	36·5	NW	3·38	0·11
3	29·908	29·622	47	41	60·5	32·0	W	3·64	
4	29·966	29·942	54	44	74·0	35·5	NW	1·56	
5	29·828	29·600	61	44	86·5	40·0	NW	1·30	
6	29·694	29·596	58	40	72·0	36·0	NW SW	5·72	0·31
7	29·819	29·798	57	38	73·0	35·0	NW	8·33	0·03
8	29·837	29·787	61	44	83·5	40·0	NW NE	1·56	0·05
9	30·009	30·000	60	44	72·5	30·0	NW NE	·26	
10	30·016	29·900	63	40	85·5	36·0	NW	·26	
11	29·678	29·635	60	46	82·0	43·0	NW	3·58	
12	29·795	29·753	57	40	80·0	36·0	NW	1·30	0·03
13	29·866	29·790	57	40	79·0	37·5	NW	·78	0·10
14	29·294	28·990	56	41	68·5	40·0	NW	1·30	0·55
15	29·264	29·090	55	37	62·0	33·5	NW	1·30	0·18
16	29·467	29·438	56	41	83·0	34·0	W NW	10·94	0·54
17	29·000	28·758	57	42	60·5	40·0	NE NW SE	1·04	0·48
18	29·139	29·114	51	38	76·0	32·0	NW	1·04	0·06
19	29·714	29·483	46	36	74·0	31·0	SW SE S	3·64	0·01
20	29·850	29·765	51	43	71·0	31·0	NW SW	1·30	
21	30·182	30·066	63	39	90·0	33·0	NW NE SW	0·	
22	30·339	30·309	60	33	90·5	29·0	NW NW SE	·52	
23	30·327	30·142	57	34	84·0	29·0	NW NW SE	0·	0·04
24	29·819	29·556	52	37	65·0	33·5	NW	·78	0·13
25	29·208	29·052	63	37	88·0	33·0	NW SW NW	·78	
26	30·388	29·313	53	44	67·0	41·0	SW NW	·78	
27	29·420	29·287	59	37	72·5	32·5	NW	·26	0·20
28	29·493	29·236	60	43	91·0	38·0	NW S SE	·52	0·05
29	29·809	29·742	64	36	89·0	31·0	NW NE SW	0·	
30	30·079	30·042	62	38	90·0	34·5	W SE NW	·52	
31	30·096	30·024	68	43	94·0	41·0	NW	·52	0·04
Monthly mean	29·684		48·85		78·11	35·40	Total force	60·01	3·59

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month.

14th.—Arbutus unedo commencing to flower.
20th.—Garrya elliptica, ditto.
21st.—Almond in full flower.
25th.—White mulberry commencing to break.
31st.—Yellow crocus commencing to flower.

Barometer mean, 29·684in., being 0·160in. below the average.
Temperature mean, 48·85°, being 3·13° above the average.
Solar intensity mean, 78·11°, being 2.60° above the average.
Dew point mean, 39·6°, being 0·46° below the average.
Humidity of air mean, ·76, being ·07 per cent. below the average.
Elastic force of vapour mean, ·260, being ·003 per cent. above the average.
Total amount of rain, 3·59in., being 1·53in. above the average.
Increase of spontaneous evaporation on rainfall, 0·42in.
Mean amount of ozone, 7·40, being 0·31 of chromatic scale above the average.
Surface-electricity feeble all through the month.
Snow never absent from Mount Wellington during the month. The low hills and ground covered with a thick layer of fresh snow on the 19th.

FRANCIS ABBOTT.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE MONTH OF JULY, 1871.

By E. Swarbreck Hall.

The weather this month was unusually wet, windy, and warm, with great mutations of atmospheric pressure, and an excessive daily-range of temperature, together with ozone above the average. It is very remarkable that exactly one-half of all the deaths were at and above 60 years of age, while deaths under 20 years old were less than one-fifth of the whole. The total deaths were about 24 per cent. less than the July average for the previous 14 years.

Atmospheric-pressure, 29·684, was — ·160 below the average. The extreme range of the month was 1·581 inches, being the largest on record. The extremes were : maximum, 30·339 on the 22nd ; minimum, 28·758 on the 17th. So low a minimum has only been registered seven times in the last 30 years. There was no excess of wind in Hobart Town, but great storms were reported elsewhere. The greatest movement of the barometer in any twenty-fours from 1 p.m. to 1 p.m. was a fall of — ·600 of an inch on the 14th, but on four other days there were movements of more than half an inch. Altogether there were 18 days on which the variations exceeded one-fifth of an inch, which is without parallel in the Hobart Town records. As is usual these excessive fluctuations of atmospheric pressure caused many deaths amongst old and debilitated people.

Wind-force total, 60·01 lbs., was + 20·46 lbs. above the July average. At 67 out of the 93 observations, with 36·85 lbs. of the force, the wind was registered from the north-west, but there is no doubt that many of them were really deflected west winds from their high ozonic character. It is, as has often been before noted, that owing to the sudden angle in the valley of the Derwent at Bridgewater eleven miles from the city, caused by the Mount Wellington tier, winds from the west are liable to be deflected towards the north-west. West and south-west winds were 13 in number with 18·22 lbs. of the force. The other winds were unusually below the average in both aspects. The strongest winds had only 5·21 lbs. pressure to the square foot, and were registered only three times. *Calms* were 23, being — 16·89 below the average.

Temperature mean, 48·85 degrees, was + 3·13 above the 25 years' average. In the previous 30 years there have only been 4 Julys with a higher temperature. It is noteworthy that the mean by the self-registering maxima and minima thermometers agree with that of the observed thermometers within a trifle. The maximum was 68 on the 31st; the minimum 33 on the 22nd. The *wet-bulb* thermometer mean, 44·98 degrees, was + 1·86 above the average.

Daily range of temperature mean, 17·23 degrees, was + 2·09 above the average. The greatest range was on the 29th, being 28 degrees. These excessive changes of temperature, together with fresh winds and an excess of ozone, caused much disease of the organs of respiration, principally catarrh, but popularly, through erroneously, called influenza.

Solar intensity mean, 78·11 degrees, was + 2·60 above the average, which is remarkable, as cloud mean was also considerably above the average. The hottest sunshine was 94 degrees on the 31st.

Terrestrial radiation mean, 35·40 degrees, was — ·15 below the average. The lowest records were in the nights of the 22nd and 23rd, being 29 degrees.

Elastic-force of vapour mean, 260, was + 3 above the average. It ranged from 175 on the 19th to 374 on the 14th.

Humidity mean, 76, was — 7 below the average. Saturation (100) was registered three times.

Rain-fall amounted to 3·59 inches, being + 1·53 above the July average. This is the first time since November, 1870, that the rainfall has attained the average. It fell in a gentle and continuous way, there being 18 wet days, or + 4·27 more than the average. No floods occurred in Hobart Town, at the same time water courses, sewers, and rivulets were thoroughly flushed. *Snow* was never absent from Mount Wellington during the month, and received frequent and copious augmentations. On the 19th the streets and low hills about the city had a good coating, but of short continuance. No ice was ever observed in or near the city, in this usually the coldest month in the year.

Spontaneous evaporation, owing to the warm and windy character of the month, exceeded precipitation, being 401 inches.

Cloud mean, 6·32, was + ·92 above the average.

Ozone mean, 7·40, was + ·31 above the average. Saturation (10) was recorded 8 times,

Electricity was registered 49 times out of the 62 observations ; 4 only were positive with tension from 4 to 5, The negatives, 45, had tension from 1 to 5. There were 13 " nils." No *thunder*, or *lightning*, or *auroral* displays.

The *deaths* during the month were 42, being — 12 12-14 below the average of the previous 14 years' Julys. Under 1 year old the deaths were 4 (the registered births in the month being 65) ; from 1 to 5 the deaths were 2 ; from 5 to 10 one ; from 10 to 15 *nil* ; from 15 to 20 1 ; from 20 to 60 there were 13. At and above 60 the deaths were 21, the oldest being 90 ; 15 out of the 21 were above 70. Males were 26 in number ; females only 16. In the *Zymotic class* of diseases there was only 1 death, a case of *croup* in a child aged 5 years. In *diseases of the brain* and *nervous system* there was the very large number of 14 deaths, many of them sudden from *apoplexy*, &c., a consequence of the rapid and extensive variations of atmospheric pressure. From *diseases of the organs of respiration* there were 5 deaths. *Consumption* caused only 1 death, a young woman born in Hobart Town. At the *Hospital* there were 10 deaths, inclusive of 1 *inquest* case, the only one in the month. Six of them were from other registration districts. One was one of the two last females of the aboriginal natives of the island, who died from *paralysis* ; recorded as 50 years old only (?) At the *Brickfields Invalid Asylum* there were 6 deaths, aged respectively 67, 71, 74, 77, 83, 90. At the *Cascades* there only 2, aged 49 and 82.

AUGUST, 1871.

Private Observatory, Hobart Town.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		Rain in inches
	Highest.	Lowest.	Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	
	In.	In	°	°	°	°			
1	30·062	29·995	57	47	72·0	43·0	WE SE	1·04	
2	30·177	30·134	62	33	87·0	27·5	NW	·78	
3	30·161	30·024	65	41	89·5	38·0	N W SE	0·	
4	29·802	29·770	62	48	85·5	43·5	NW W NW	3·38	
5	29·853	29-771	62	44	86·0	40·0	NW SW	·52	
6	29·664	29·609	70	39	92·0	34·5	N NE	0·	
7	29·684	29·598	63	44	88·5	41·5	NW W	1·30	0·06
8	29·678	29·656	54	41	57·0	39·0	SE S SE	1·04	
9	29·824	29·787	56	37	85·0	32·5	W SW SE	·52	
10	29·812	29·801	65	36	89·0	31·5	NE NW S	·52	
11	29·852	29·774	62	41	81·5	40·5	NW	·52	
12	29·824	29·802	68	41	92·5	34·5	NW	·26	
13	29·823	29·674	67	45	93·0	40·0	NW	2·86	0·16
14	29·934	29·790	58	40	87·0	36·5	NW	1·04	
15	29·934	29·761	60	40	90.0	37·5	NW SW W	3·38	0·15
16	30·224	30·145	59	35	84·0	29·0	NW N	·26	
17	29·970	29·726	61	38	84·0	36·0	NW	·78	
18	29·556	29·543	56	42	60·5	37·5	NW	·52	0·07
19	29·774	29·724	65	34	90·0	30·0	N NW	1·30	
20	29·464	29·281	61	40	84·5	38·0	NW	2·86	0·15
21	29·603	29·467	58	40	87·5	37·5	NW W NW	1·56	0·09
22	29·865	29·838	61	46	93·0	43·5	NE NW	1·04	0·05
23	29·976	29·848	58	44	86·5	43·0	NW S SW	·78	
24	29·917	29·441	53	34	75·5	30·5	NW	1·30	0·08
25	29·387	29·335	56	43	83·0	43·0	NW W	3·64	0·75
26	29·879	29·861	60	43	90·0	39·5	NW	1·04	
27	29·882	29·800	60	45	87·0	40·0	NW SW SE	·78	
28	30·032	29·957	62	32	91·0	29·5	NW SE	·26	
29	29·695	29·301	52	37	56·5	32·0	NW	1·04	0·31
30	29·530	29·409	58	42	86·5	41·0	NW SW NW	1·04	
31	29·512	29·483	57	43	75·5	39·5	NW	·26	0·12
Monthly mean 29·761			51·45		83·56	37·08	Total Force	35·88	1·99

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few standard plants in the Royal Society's Gardens during the month.

12th.—Sambucus niger commencing to break.
15th.—Gooseberries ditto.
18th.—Horse chestnut ditto.
23rd.—Elm commencing to flower.
24th.—Poplar commencing to break.
29th.—Apricot ditto.

Barometer mean, 29·761in., being 0·046in. below the average.
Temperature mean, 51·45°, being 3·38° above ditto.
Solar intensity mean, 83·56°, being 8·04° above ditto.
Dew point mean, 40·08°, being 0·76° per cent. below ditto.
Humidity of air mean, ·71, being ·09 above ditto.
Elastic force of vapour mean, ·265, being ·003 per cent. above ditto.
Total amount of rain, 1·99, being 0·16in. above ditto.
Increase of spontaneous evaporation on rainfall, 0·93in.
Mean amount of ozone, 6·42, being 1·18 of chromatic scale below the average.
Electricity active on the 2nd, 7th, 10th, 14th, 15th, 16th, 23rd, 26th, 27th, and 28th.
A brilliant Aurora on the 6th.
High wind, 15·62lb. to square foot on the eve of 21st.
Snow remaining on Mount Wellington during the month, with frequent fresh deposits.

FRANCIS ABBOTT.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE MONTH OF AUGUST, 1871.

By Dr. E. Swarbreck Hall.

Except in a warmer temperature than usual, the weather during this month departed less from the average normal character than usual. The deaths were much below the average of the previous 14 years, and specially so in those at all ages under 20 years old.

Atmospheric pressure mean, 29·761, was only — ·046 below the 25 years' standard mean. The maximum, 30·224, occurred on the 16th; the minimum, 29·281, was noted on the 20th. The extreme range of the barometer for the month was only ·943 of an inch, which has been largely exceeded in 12 out of the previous 16 years. Nevertheless, the daily mutations, within this extreme range, were very great; the greatest being a fall of — ·589 on the 29th; and on the 26th there was a rise of + ·527. On 10 other days there were variations exceeding one-fifth of an inch. As usual, these excessive fluctuations of atmospheric pressure told heavily on diseased, feeble, and aged people, while young and healthy persons were little affected by them.

Wind-force recorded at the usual hours of observation amounted on the whole to 35·88 lbs., being —10·61 lbs. below the average; but in the nights of the 21st and 26th there blew gales having a pressure of 15·62 lbs. each to the square foot, which really made the wind-force of the month in excess. The strongest winds recorded at the usual hours of observation, 7 a.m., 1 p.m., and sunset, were only 2·60 lbs., registered four times. North-west winds had 60 out of the 93 observations with strength of 23·40 lbs., but this must be qualified by the same remarks that were made in the previous month; many of these winds so registered being really deflected West winds. The *calms* were 30, being — 5·33 below the average.

Temperature mean, 51·45 degrees, was + 3·38 above the 25 years' average. The extremes were 70 degrees at about midday on the 6th, and 32 in the night of the 28th. Both higher and lower registers have often been made in August. *Wet bulb* mean was 46·45, being only + 1·39 above the average.

Daily Range of Temperature mean, 19·90 degrees, was + 3·47 above the average, showing how necessary it is to take into consideration every meteorological record before drawing conclusions from the means of any one instrument. The greatest range was 31 degrees, noted on the 6th and 19th.

Solar-Intensity mean, 83·56 degrees, was + 8·08 above the average. The maximum was 93 degrees on the 13th and 22nd, and much greater heat than this has often been recorded.

Terrestrial-Radiation mean, 37·08 degrees, was + 1·28 above the average. The coldest night was the 16th, when this self-registering thermometer on the grass recorded 29 degrees only.

Elastic-force of vapour mean, 265, was — 3 below the average. The range was from minimum 175 at 7 a.m. on the 16th to maximum 353 at noon on the 6th.

Humidity mean, 71, was — 9 below the average, Saturation (100) was never recorded.

Rainfall — 1·99 inches was + ·16 above the average. It fell on 11 days, being — 2·45 below the average. In another and more elevated part of the city 18 wet days were registered, with a total fall of 2·51 inches. It was generally felt that this August was much wetter than usual. *Snow* was never absent from Mount Wellington during the month, and received frequent and copious additions, but none ever fell in the city.

Spontaneous Evaporation amounted to 2·92 inches.

Cloud Mean, 5·39, was — ·31 below the average.

Ozone Mean, 6·42, was —1·10 below the average, ranging from 3·5 to 9.

Electricity had 21 positive indications with tension ranging from 3 to 6. The negatives were 36, with tension from 1 to 6. There were 5 *nils*. Neither *thunder* nor *lightning* were observed during the month. An *Aurora* was registered on the evening of the 6th.

The *Deaths* during this month were 34, being —12 less than the average of the previous 14 years. Only one year out of the fourteen, 1866, had less; *i.e.*, 33. The range being from that to 74 in 1858. Under one year old there was only one death; from 1 to 5 there were 3; from 5 to 10, one; from 10 to 15 none; from 15 to 20, one. So small a proportion of the total deaths under 20 years old is very remarkable, August 1870 had ten more. From 20 to 60 the deaths were 17, being one less than in August 1870. At 60 and all ages above the deaths were 11, being — 4 less than in 1870. The three oldest this month were above 80 years old, the oldest being 86. In the *Zymotic Class* only one death was recorded, a man aged 60 from *gastric fever*. From *consumption* there were 4 deaths, 2 of them natives of Tasmania, born in Hobart Town, women, aged 21 and 25 respectively. One a man aged 44, a shoemaker, born in Dublin; the other a man, aged 52, a truss-maker, born in Middlesex. In the public *Hospital* there were 11 deaths, all belonging to the Hobart Town registration district, except one from Green Ponds. There was only one *Inquest* on a man who died in hospital to which he was removed from the gaol. At the *Brickfields Invalid Asylum* there were 3 deaths, aged respectively 64, 68, 83. At the *Cascades* establishment two men died aged 58 and 73, the average age in the latter being eleven and a half years less than in the former. At the *Queen's Asylum* for orphan and destitute children, a girl aged 15 died from *abscess of the liver*.

SEPTEMBER, 1871.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		Rain in inches.
	Highest.	Lowest.	Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	
	In.	In.	°	°	°	°			
1	29·670	29·495	58	37	90·0	32·5	NW	1·04	0·04
2	29·792	29·572	53	38	85·5	35·0	NW SW SE	5·46	0·37
3	30·032	30·014	64	39	88·5	35·5	NW	1·04	
4	30·092	29·950	58	46	66·0	42·0	SW N SW	2·86	
5	30·219	30·176	61	39	91·5	33·0	NW SE	·26	
6	30·027	29·710	66	35	96·0	31·0	NW	·52	0·21
7	29·307	29·185	61	47	75·5	43·5	NW	·52	0 16
8	29·505	29·456	57	43	82·0	40·0	NW	·78	0·09
9	29·890	29·587	53	38	78·0	34·5	W SW	5·56	
10	30·111	30·044	68	39	99·5	36·5	SW N NW	·78	0·02
11	30·060	30·002	63	49	88·0	47·0	NW	·52	0·05
12	30·014	29·990	60	46	66·0	42·0	SE NW SE	·78	0·01
13	29·848	29·707	64	47	82·0	43·0	NW N NE	·52	
14	29·810	29·763	70	46	104·5	42·5	NW SE	0·	
15	30·179	30·061	60	41	95·0	37·5	NW SW SE	·78	
16	30·369	30·334	63	45	99·0	42·5	SW SE NE	·78	0·25
17	30·242	30·034	56	47	60·0	40·0	NW	1·04	
18	29 977	29·890	71	49	105·0	48·0	NW SE	·52	
19	30·337	30·262	65	43	100·0	41·0	W NE SE	·52	0·04
20	30·241	30·115	63	49	95·0	45·0	SW NE SE	·78	
21	30·106	29·902	74	42	105·0	40·0	NW SE NE	·26	0·06
22	29·771	29·665	63	52	85·5	50·0	NW SW	·26	0·03
23	29·863	29·842	67	46	100·0	46·0	NW	·26	
24	29·765	29·576	67	45	94·0	41·5	NW SW	·78	0·07
25	29·650	29·580	61	44	95·0	38·5	NW SW	3·52	0·03
26	29·881	29·751	69	49	98·0	39·0	NW	1·08	
27	29·691	29·484	69	47	95·0	45·0	NE NW	7·84	0·12
28	29·830	29·742	64	47	94·0	42·0	SW	7·81	
29	29·864	29·617	66	39	96·0	36·0	NW	·52	
30	29·750	29·721	63	44	97·5	39·5	NE NW.	2·04	0·05
Mean monthly	29·866		54·22		90·23	40·32			1·60

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few standard plants in the Royal Society's Gardens during the month.

14th.—Ash commencing to break into leaf.
22nd.—Grape vines do do.
26th.—Oak do do.
27th.—Moutan Peony commencing to flower.
29th.—Horse chestnut do do.
30th.—Robinia pseudo-Acacia commencing to leaf.

Barometer mean, 29·866in., being 0·105in. above the average.
Temperature mean, 54·22°, being 3·46° above the average.
Solar intensity mean, 90·23°, being 1.69° above the average.
Dew point mean, 44·1°, being 1·93° above the average.
Humidity of air mean, ·71, being ·05 per cent. below the average.
Elastic force of vapour mean, ·298, being ·009 per cent. above the average.
Total amount of rain, 1·60in., being 0·48in. below the average.
Increase of spontaneous evaporation on rainfall, 1·50in.
Mean amount of ozone, 8·35, being 0·39 of chromatic scale above the average.
Electricity active on the 3rd, 4th, 5th, 8th, 10th, 16th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, and 30th.

Fresh fall of snow on Mount Wellington on the 2nd and on the 9th, a heavy fall on the mountain and low hills, remaining in abundance until the end of the month.

FRANCIS ABBOTT.

XX.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE MONTH OF SEPTEMBER, 1871.

BY E. SWARBRECK HALL.

With the exception of June last, this is the only month since August, 1870, in which the deaths have exceeded the average of the previous 13 and 14 years.

The detailed remarks on the various meteorological phenomena of the month will indicate some of the causes to which this excessive mortality may reasonably be ascribed.

Atmospheric pressure mean, 29·866, was + ·105 above the 25 years' standard mean for September. It ranged from minimum, 29·185 on the 7th, to 30·369 on the 16th, being an extreme range for the month of 1·184 inches. The greatest movement of the barometer in any 24 hours from 1 p.m. to 1 p.m., was a fall of — ·682 of an inch on the 7th, being the largest recorded during the last 11 years. On 15 other days the movements exceeded one-fifth of an inch, which is an unusually large proportion for any month.

Wind-force total was 42·23 lbs., being — 30·30 less than the average for this usually very windy equinoctial month. The strongest winds were only 5·21 lbs. pressure to the square foot; one was from the north-west recorded on the evening of the 27th ; the other west at the morning observation on the 9th. At only five other observations was the pressure of 2·60 lbs. registered. At 50 out of the 90 observations the wind blew from the north-west, with 22·11 lbs. of the total force. From north, north-east, east, south-east, and south, only 23 winds were recorded with the very small united force of 4·94 lbs. *Calms* were 28 in number, being + 5·55 above the average.

Temperature mean, 54·22 degrees, was + 3·46 above the September average. In the previous 30 years, only the Septembers of 1858 and 1855 were warmer than the present month. The high-day mean was 63·23 degrees, the low-night 43·93 degrees. The maximum was 75 degrees, noted on the 21st; the minimum was 35, which occurred in the night of the 6th. *Wet-Bulb* mean was 49·19 degrees, being + 2·62 above the average.

Daily-range of temperature mean, 19·30 degrees, was + 1·66 above the average. The greatest was 32 degrees on the 21st.

Solar intensity mean, 90·23 degrees, was + 1·69 above the average. The highest was 105 degrees recorded on the 18th and 21st.

Terrestrial-radiation mean, 40·32 degrees, was + 1·93 above the average. The lowest was 31 degrees on the 6th.

Elastic-force of vapour mean, 298, was + 19 above the average, ranging from 182 on the 6th, to 501 on the 18th.

Humidity mean, 71, was — 5 below the average.

Rain-fall amounted to 1·60 inches, which is — ·48 below the September average. There were 16 days on which rain was registered, being + ·73 above the usual number. On four days enough fell to scour the gutters and drains, but not so heavily as to cause floods ; the rest was deposited in light genial showers, keeping the ground in the most advantageous state for vegetation. *Snow* was never absent from Mount Wellington during the month, and received frequent and copious additions.

Spontaneous-evaporation amounted to 3·10 inches.

Cloud mean, 6·42, was + ·58 above the average.

Ozone mean, 8·35, was + ·39 above the average.

Saturation (10) was recorded 11 times. This excessive purity of the air, together with excessive daily range of temperature and frequent variations of atmospheric pressure, would account for the excessive number of deaths.

Electricity had 20 positives with tension from 4 to 9 ; and 34 negatives with tension from 1 to 10, and 6 "nils." So high a tension has never before been recorded either from positive or negative. No *thunder* heard or *lightning* seen during the month. *Southern lights* were seen on the evening of the 3rd.

The deaths during this month were 46, and as the average for September for the previous 14 years was $40^{10}/_{14}$ the deaths were in excess by $+ 4^{4}/_{14}$ With the exception of June, this is the only month since August, 1870, in which the deaths have exceeded the average. The range for September in the 14 years was from 56 in 1862 to 22 in 1869. Under one year old this month the deaths were 7, while September, 1870, had only 5; at one to five years of age there was only one death, being the same as in September last year; at five to ten there were two deaths, while September, 1870, had three; at 10 to 20 the deaths were three; while September last year had not any; at from 20 to 60 the deaths were 16, while last year they were only 13; at 60 and all ages above there were 17 deaths, the oldest being a man at the Brickfields Invalid Asylum aged 85; altogether 15 out of the 17 were aged 70 and above. Last year the deaths above 60 were 16. In the *Zymotic* class of diseases only one death can be tabulated, and that is doubtful, being a child 18 months old from *Diarrhœa*, an out-patient of the Hospital. Last year had two deaths from croup in this class. In the *Cachectic* or *Constitutional* class of diseases there were three deaths: one from *Dropsy*, two from *Consumption*, the latter were, a youth of 16, a married woman aged 38, both natives of Tasmania. In 1870 this class had six deaths, three of them from consumption, and two of them natives of Tasmania. In 3rd class, *Monorganic* or *local* diseases, there were 33 deaths, while 1870 had only 16. In the 1st order of this class, diseases of the *brain and nervous system*, there were seven deaths, 1870 had only four. In the 2nd order, diseases of the *heart and organs of circulation*, there were seven deaths, 1870 had only four deaths. In the 3rd order, diseases of the *lungs and organs of respiration*, there were 10 deaths, while 1870 had only three. The excess in this class makes up the difference, within one, of the total deaths from all causes between this year and the last. Last year ozone was — ·99 below the average, this year it was + ·39 above the average, and this valuable agent so antagonistic to diseases arising from impure air—being nature's grand disinfecting agent—when in excess always over-stimulates the air passages of the organs of respiration, producing catarrh (not influenza), bronchitis, and pneumonia. The variations of temperature also were greater this month than in 1870. The difference in the other classes and orders between the two years were not material, and need not be detailed. In the public Hospital there were nine deaths, all belonging to the Hobart Town Registration District; last year there were only seven. Inquests were three, all from natural causes; last year there was only one. At the Brickfields Male Invalid Asylum there were two deaths, aged respectively 78 and 85; last year there were not any. At the Cascades there were four deaths, two men aged respectively 68 and 75, and two women, 58 and 70.

OCTOBER, 1871.
PRIVATE OBSERVATORY, HOBART TOWN.

	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		
Day of Month.	Highest.	Lowest.	Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	Rain in Inches
	In.	In.	°	°	°	°			
1	29·812	29·775	57	38	91·0	34·5	NW SE	·78	0·32
2	30·075	29·989	49	38	56·5	34·0	SW S	3·12	0·05
3	30·072	30·024	57	38	95·0	32·0	NW SE SW	·52	
4	29·976	29·865	62	42	97·0	40·0	SW SE	·52	0·05
5	29·853	29·763	62	42	101·0	38·5	SW SE	·78	0·07
6	29·954	29·853	55	44	66·5	41·0	SE	1·56	0·06
7	30·003	29·976	55	45	67·0	40·0	SW SE	3·12	
8	30·124	30·065	62	44	107·0	42·0	SW SE	1·56	
9	30·164	30·099	68	38	104·0	35·5	NW SE	·78	0·02
10	29·950	29·667	79	44	112·0	42·0	NW	5·73	0·02
11	29·752	29·721	56	45	90·5	40·5	SE	·52	0·09
12	29·348	29·233	57	45	94·0	40·0	NW	7·81	
13	29·614	29·570	62	42	91·0	40·0	W SE NW	5·99	
14	29·692	29·669	68	47	99·0	40·5	NW	5·72	0·31
15	29·576	29·545	67	48	100·0	41·0	NW W NW	10·94	
16	29·655	29·559	66	50	99·0	47·0	NW W SW	8·33	0·03
17	30·065	29·958	61	41	97·5	38·0	W NW W	8·33	
18	30·112	29·939	63	48	102·0	40·5	NW	6·25	
19	30·161	29·995	60	46	97·5	40·0	SW	8·33	
20	30·266	30·202	68	37	106·0	34·0	NW NE SE	·52	
21	30·170	30·126	61	42	75·5	39·0	NW SE	·52	
22	30·160	30·152	66	45	106·0	42·5	NW SE	1·04	
23	30·198	30·031	73	43	110·0	40·0	W SE	1·04	
24	29·926	29·782	84	50	117·0	47·5	NW NE	5·46	
25	29·892	29·821	80	46	90·5	46·0	SE E NW	3·64	0·47
26	29·920	29·857	64	42	99·5	38·0	NW W NW	3·64	
27	29·950	29·915	60	43	87·0	39·5	NW NE E	·26	
28	29·912	29·871	64	47	92·0	45·5	NW SW SE	3·38	
29	29·937	29·899	68	47	103·0	45·0	NW	1·04	
30	29·890	29·825	71	48	105·0	44·0	NW W	3·38	
31	29·782	29·551	72	50	103·0	45·0	NW W	21·35	0·03
Monthly mean	29·891		55·33		95·71	40·42	Total force	126·74	1·52

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month.

8th.—Carpinus betulus commencing to leaf.
18th.—Ailanthus glandulosa ditto ditto.
24th.—Tilea Europea (Lime) ditto ditto.
27th.—Morus niger ditto ditto.
28th.—Elm seeds commencing to fall.
31st.—Melia azederach commencing to leaf.

Barometer mean, 29 891in., being 0·107in., above the average.
Temperature mean, 55·33°, being 1·39° above the ditto.
Solar intensity mean, 95·71°, being 0·11° above the ditto.
Dew point mean, 43·2°, being 1·20° below the ditto.
Humidity of air mean, ·67, being ·06 per cent. below the ditto.
Elastic force of air mean, ·287, being ·013 above the ditto.
Total amount of rain, 1·52in., being 0·45in. below the ditto.
Increase of spontaneous evaporation on rainfall, 2·02in.
Mean amount of ozone, 8·47, being 0·55 of chromatic scale above the ditto.
Electricity active all through the month, with 17 positive, and 45 negative.
Snow never absent from Mount Wellington during the month, with a fresh deposit on the 16th.

FRANCIS ABBOTT.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE MONTH OF OCTOBER, 1871.

By Dr. E. Swarbreck Hall.

The extreme purity of the atmosphere, very great aerial movement, with strong tension and great prevalence of electricity, were the peculiar characteristics of this month. Deaths were slightly below the average, and fell principally upon adults and old people, the deaths under 20 years old being only about one-fifth of the total at all ages.

Atmospheric-pressure mean, 29·891, was + ·107 above the 25 years' adopted standard mean for October. The minimum was 29·233 on the 12th; the maximum was 30·242 on the 20th; consequently the extreme range in the month was 1.009 inches. The greatest movement of the barometer in any 24 hours was a fall of —·519 of an inch on the 12th. On seven other days the movements exceeded one-fifth of an inch.

Wind-force total, 126.74lbs. was +26.79 above the average for October, and also above the average of any other month. *North West* had the greatest number and the greatest force, though it is evident many recorded for this point of the compass were really deflected West winds. 29 *South East* winds out of the 93 observations were registered, but with only a total force of 12.74lbs.; nevertheless this is considerably in excess of the average from this point of the compass, which in Hobart Town is the purest wind, and most conducive to health. *North*, *North East*, and *East* winds were scarcely appreciable; but *South West* and *West* were above the average number and strength. There was only one *South* noted, but it had the force of 2·60lbs. to the square foot. The strongest wind was a gale from the *West* on the evening of the last day of the month, with a force of 15·62lbs. to the square foot. *Hot winds* of a moderate character were noted on the 10th, 24th, 31st. *Calms* were 12 in number, being 3·22 below the average.

Temperature, mean, 55·33 degrees, was +1·39 above the average, according to the three daily observations, but more than one degree less by the self-registering maximum and minimum thermometers. The extremes were: maximum, 84 on the 24th; minimum, 37 in the night of the 20th. The *wet bulb* thermometer had the mean of 40·22 degrees, which is only +·03 above the average.

Daily range of temperature mean, 20·39, was +1·72 above the average. The greatest range was on the 10th, being 35 degrees.

Solar-intensity mean, 95·71 degrees, was only +00·11 above the average. The hottest record was 117 degrees on the 24th.

Terrestrial-radiation mean, 40·42 degrees was —1·57 degrees below the average. The coldest record was 32 degrees (freezing point) in the night of the 3rd. On the day following four deaths occurred, being double the number for any other day of the month.

Elastic force of vapour mean, 287, was —13 below the average, ranging from minimum 179 at the evening observation on the 4th, to maximum 413 on the evening of the 23rd.

Humidity mean, 67, was —6 below the average. The highest record was 93 on the morning of the 25th, but saturation (100) was never noted.

Rain-fall amounted to 1·52 inches, which is —·45 less than the October average. There were 12 days on which rain was recorded, being — 2·90 less than the average. On three days the rain fell sufficiently to cleanse water-courses, sewers, &c., the heaviest fall being ·42 of an inch on the 25th. *Snow* was never absent from Mount Wellington during the month, and received frequent additions, so copiously on the 3rd as to coat the mountain to its base. There was a smart hail storm in the city on the 2nd.

Spontaneous-Evaporation amounted to 3·54 inches.

Cloud mean, 5·90, was + ·20 above the average.

Ozone mean, 8·47, was + ·55 above the average. At 17 observations saturation (10) was registered, which is without parallel in the Hobart Town records. Deaths from diseases of the organs of respiration, consequently, were above the average.

Electricity had 17 positives, with tension from 5 to 8·5; and 45 negatives, with tension from 4 to 9; no nils.

Deaths were 41 in number being—2 7-14ths less than the October rate. The October range is from minimum 29 in 1861, to maximum 59 in 1869. Under one year old there were 6 deaths, one being only 3 days, the second two weeks, the third 3 weeks old. October, 1871, had the same number. From 1 to 5 there were 2 deaths, last year had twice as many. From 5 to 10 there were no deaths. October, 1870, had one. From 10 to 20 there was one death, while last year had 2. From 20 to 60 there were 17 deaths, while 1870 had only 6. At 60 and all ages above there were 15 deaths, the oldest being a woman of 82, last year had 16 the oldest a woman of 84. In the *zymotic* class of diseases there was not a single death. In the *Cachectic* or Constitutional Class there were 7 deaths, three from cancerous affections of various organs, three from *Consumption*, two of them natives of Tasmania, the third a German man, one from *Dropsy*. In diseases of the *Brain and Nervous System* there were 10 deaths; from diseases of *Heart and organs of Circulation* there was only one death. From diseases of the *Lungs and organs of Respiration* their were 9 deaths. From old age, &c., 5. The remainder do not require particularizing. At the *Hospital* there were only 5 deaths, two of them not belonging to the Hobart Town Registration District. At the *Brickfields Male Invalid Asylum* there was only one death at 55 years old. At the *Cascades* there were three men aged, one 69, two 70, and one woman aged 47. There were two *Inquests*, one returned "manslaughter," the other "found drowned," the poor Orphan Asylum apprentice Claravance Barker.

NOVEMBER, 1871.

PRIVATE OBSERVATORY, HOBART TOWN.

	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		
Day of Month.	Highest.	Lowest.	Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	Rain in inches.
	In.	In	°	°	°	°			
1	29·834	29·808	63	42	87·0	39·0	NW SW W	1·04	
2	29·834	29·691	68	43	104·0	38·0	NW	3·04	0·02
3	29·725	29·696	63	44	103·0	40·0	SW NW NE	·78	0·38
4	29·658	29 509	65	47	90·0	33·0	SW NW SE	1·30	
5	29·744	29·703	59	41	98·5	40·0	NW SE SW	·78	
6	29·869	29·845	66	45	94·0	42·0	NW W	1·04	
7	29·834	29·613	68	47	94·0	41·0	NW	21·35	
8	29·844	29·517	66	56	107·5	50·0	NW W	10·41	
9	30·320	30·140	61	46	104·0	43·5	SW SE	5·46	
10	30·347	30·168	60	44	83·0	40·0	NW NE	5·40	0·19
11	29·937	29·749	70	50	76·5	45·5	NW	0·	0·26
12	29·863	29·795	70	54	73·0	51·0	W SE	1·04	0·10
13	29·994	29·929	67	53	90·0	50·0	SE	·78	0·02
14	29·824	29·485	68	54	93·0	54·0	SE E SE	·78	0·18
15	29·789	29·651	68	49	74·0	41·0	SE	3·64	0·34
16	29·959	29·934	55	45	65·5	42·0	SE	1·30	0·06
17	30·048	30·025	59	43	89·0	40·5	SW SE	1·30	
18	29·957	29·915	65	44	107·0	39·5	W SW SE	2·86	
19	30·145	30·120	62	45	97·0	41·0	SE SW SE	1·30	0·05
20	30·022	29·897	73	47	108·0	41·0	NW SE	·78	0·17
21	30·026	29·984	63	51	68·0	48·0	SE	·26	
22	30·034	29·972	67	52	104·0	49·0	NE N NE	·78	0·60
23	29·677	29·462	66	53	91·5	49·5	SE	·78	0·62
24	29·454	29·342	65	54	73·0	50·0	NW W SW	1·04	0·08
25	29·521	29·351	69	47	102·0	40·5	NW SE NW	·78	0·03
26	29·636	29·480	69	50	103·0	47·5	NW W	3·38	
27	29·839	29·755	71	53	105·5	50·0	NW W	1·04	
28	29·866	29·799	71	56	110·0	50·0	NW	1·30	
29	30·002	29·921	68	49	94·0	45·0	NW	1·04	0·04
30	30·104	30·074	72	52	107·0	50·0	NE SW SE	1·04	
Monthly mean	29·832		58·39		93·2	44·38	Total Force	76·48	023·

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month.

15th.—First strawberry ripe.
20th.—First cherry ripe.
22nd.—Black mulberry in blossom.
27th.—Pomegranate in flower.
28th.—First raspberry gathered (Antwerp).
30th.—Bougainvillœa spectabilis in full flower.

Barometer mean, 29·832in., being 0·087in. above the average.
Temperature mean, 58·39°, being 2·73° below ditto.
Solar intensity mean, 93·20°, being 10·77° below ditto.
Dew point mean, 46·6°, being 2·42° below ditto.
Humidity of air mean, ·69, being ·01 per cent. above ditto.
Elastic force of vapour mean, ·337, being ·015 per cent. below ditto.
Total amount of rain, 3·02in., being 1·29in. above ditto.
Increase of spontaneous evaporation on rainfall, 0·49in.
Mean amount of ozone, 8·32, being 1·13 of chromatic scale above the average.
Electricity active on the 2nd, 3rd, 4th, 5th, 7th, 8th, 9th, 10th, 16th, 17th, 19th, 20th, 26th, and 29th.
Mount Wellington covered with fresh snow on the 5th.
Heavy storm of thunder, lightning, and rain on the 23rd.

FRANCIS ABBOTT.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE MONTH OF NOVEMBER, 1871.

By E. Swarbreck Hall.

The deaths this month were considerably above the average, though no epidemic disease prevailed. There does not appear anything in the meteorological phenomena so adverse to health and life to have caused this excess in the death rate, except excess of ozone and deficiency of sunshine, and great elastic force of vapour.

Atmospheric pressure mean, 29·832, was +·111 above the 25 years' standard average. The extreme range of the month was 1·005 inches; the maximum, 30·347, having occurred on the 10th; the minimum, 29·342, noted on the 24th. The greatest range in any 24 hours was registered on the 9th, being — ·467. On only nine other days were the mutations more than one-fifth of an inch. There was therefore nothing unusually remarkable in the barometrical movements to affect the death rate.

Wind force total was 76·48lbs., being — 35·85 below the average for November. The ozone bearing *south-east* winds were greatest in number, but the *north-west* with the reverse character were above twice as much in force. From the other points of the compass there was no remarkable deviation from the standard average. The strongest wind was a north-west on the 7th, having a pressure to the square foot, at the sunset observation, of 15·62lbs. *Calms* were 16 in number, being + 6·33 above the average.

Temperature had the mean of 58·39 degrees by the observed thermometers, but more than a degree and a quarter less by the self-registering. The former was only +·85 of a degree above the November average. The extreme was maximum 73 on the 20th, the minimum 37 in the night of the 4th. The latter was therefore the same as in October, while the former was 11 degrees less. The *wet-bulb* thermometer had the mean of 52·65 degrees, which is +·80 more than the average.

Daily-range of temperature mean, 17·70 deg., was —1·38 below the average. The greatest range in any 24 hours was 28 degrees, noted on the 4th. On several days in the month fires were essential to comfort in sitting rooms.

Solar-intensity mean, 93·20 degrees, being — 8·61 degrees below the average. The numerous wet and cloudy days account for this. The hottest record was 110 degrees on the 28th.

Terrestrial-radiation mean, 44·38 degrees, was + 2·11 above the average. The coldest record was 33 degrees in the night of the 4th.

Elastic-force of Vapour mean, 337, was + 12 above the average. This condition of the atmosphere is adverse to health and life. The range was from minimum 224 to maximum 550.

Humidity mean, 69, was — 2 below the average.

Rain-fall amounted in the aggregate to 3·02 inches, being +·18 of an inch above the average of this the wettest month in the year. It fell on 16 days, which is + 3·18 above the average number. On the 23rd more than one-third of the whole was precipitated, but in so moderate a way as not to cause floods. The soil was kept moist during the whole month, greatly to the advantage of vegetation; and both the air and the surface of the earth were well washed from impurities.

Spontaneous Evaporation amounted to 3·51 inches.

Cloud mean was 7·69, being + 1·63 above the average, an unusual excess.

Ozone mean, 8·38, was + ·82 above the average. At 12 observations saturation (10) was recorded. The excess of ozone did not, as in the previous month, tell so much on diseases of the organs of respiration, as the winds were not so high, or so dry.

Electricity had 12 positives, with tension ranging from 4·5 to 8·5. The negatives were 41, with tension ranging from 2·5 to 8·5. There were 7 *nils*. There was a heavy storm of *thunder*, *lightning*, and *rain* on the 23rd.

The *Snow* of the previous month continued on Mount Wellington until the 5th, when it received a very copious augmentation, but disappeared altogether after the 9th.

Deaths were 45, being + 7·6—14 above the average of the previous 14 years.

Under one year old there were only 5 deaths. From 1 to 5 there were 4. In the next three quinquennial periods there was one each. From 20 to 60 there were 13 deaths, and at 60 and all ages above, the oldest being a man at the Brickfields Invalid Depôt, aged 88, there were the very large number of 20 deaths. The month, therefore, was very auspicious to all under 20 years old, but very fatal to all above 20, and more especially to those above 60. In the *Zymotic* class of diseases there were 2 deaths from *Diarrhœa.* In the *Cachectic* class there were 4 deaths, 3 from *Cancer* of different internal organs, and one from *Consumption,* the latter not belonging to Tasmania, being a sailor from a ship in port and a native of the Sandwich Islands. In diseases of the *Brain and Nervous System* there were the unusually great number of 13 deaths. In diseases of the *Heart,* &c., 5. Diseases of the *Lungs and Organs of Respiration* 5 also; *Stomach and Organs of Digestion* 7. Other classes a few only in each. At the *Hospital* there were 14 deaths, but five of them did not belong to the Hobart Town Registration District. At the *Brickfields Male Invalid Depôt* there were 4 deaths, but another was removed to and died in Hospital. At the *Cascades Invalid Stations* there were only 2 deaths, one male aged 60, one female aged 65. There were only two *Inquests.*

DECEMBER, 1871.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of month.	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		Rain in Inches.
	Highest.	Lowest.	Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	
	In.	In.	°	°	°	°			
1	30·174	30·075	71	52	110·0	50·0	NE SE	·52	
2	29·984	29·947	76	55	111·0	51·0	NW SE	1·30	0·03
3	29·994	29·909	78	54	115·0	50·5	NE SE	1·04	
4	29·939	29·592	98	65	132·0	52·0	NW	7·80	
5	29·937	29·778	88	56	118·5	50·0	E SE	1·30	
6	29·924	29·843	79	51	112·0	45·0	NW SE	3·12	
7	29·968	29·930	75	53	109·0	49·0	NW SE	1·30	0·25
8	29·843	29·586	75	54	102·0	52·0	NW SE NW	·78	
9	29·762	29·677	79	58	112·0	56·5	NE NW W	1·30	
10	29·884	29·862	74	49	95·0	41·5	NW SE SW	1·04	0·20
11	29·580	29·354	68	49	89·0	45·0	NW W	1·04	
12	29·484	29·262	66	48	88·0	44·5	SW NW	3·64	0·03
13	29·698	29·618	70	42	81·5	38·5	NW W	7·80	
14	29·874	29·860	68	54	75·0	45·0	NW	3·36	
15	29·874	29·836	73	54	115·0	52·0	NW SE	3·12	0·02
16	29·675	29·422	82	53	96·0	45·0	NW	2·86	
17	29-593	29·362	80	56	110·0	54·5	NW W NW	10·94	
18	29·941	29·827	80	55	110·0	52·0	NW	1·56	
19	29·989	29·951	70	52	107·0	44·0	NW SE	·52	
20	30·069	30·043	76	58	110·0	55·0	SE	1·30	
21	29·910	29·659	87	58	128·0	53·5	NW SE	·78	
22	29·642	29·328	87	65	107·0	64·0	NW W	7·80	
23	29·888	29·828	75	55	115·5	52·0	NW NE	1·04	
24	29·686	29·599	71	57	114·0	47·5	NW SW	3·72	
25	29·797	29·686	70	45	109·0	41·0	NE NW	1·56	
26	29·877	29·729	67	51	95·0	49·0	NW W	1·04	
27	29·995	29·939	73	42	112·0	36·5	NW SE	1·04	
28	30·061	29·924	73	50	110·0	44·0	NE E SE	1·30	
29	30·124	29·953	82	52	118·0	44·0	NW SE	1·30	
30	29·659	29·528	91	50	125·0	51·0	NW SE	1·04	
31	29·620	29·553	72	54	112·5	46·0	NW SW W	18·23	
Monthly Mean 29·790			65·95		107·71	48·41	Total Force	96·51	0·53

The mean in all cases is taken from the sums of the three daily registers, **and not from the maximum and minimum.**

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens during the month.

8th. First bunch red currants ripe.
10th. Common privet commencing to flower.
12th. First bunch black currants ripe.
20th. Doyenne d'Ete pear ripe.
21st. Melia Azederach commencing to flower.
24th. Juneating apple commencing to ripen.

Barometer mean, 29·799 in., being 0·045 in. below the average.
Temperature mean, 65·95°, being 4·83° above the average.
Solar intensity mean, 107·71°, being 3·77° above the average.
Dew point mean, 49·7°, being 0·68° above the average.
Humidity of air mean, ·59, being ·09 per cent. below the average.
Elastic force of vapour mean, ·380, being ·028 per cent. above the average.
Total amount of rain, 0·53in., being 1·20in. below the average.
Increase of spontaneous evaporation on rain fall, 3·46in.
Mean amount of ozone, 7·22, being 0·03 of chromatic scale above ditto.
Electricity active on the 5th, 6th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 22nd, 23rd, 24th, and 25th.

Hot wind on the 4th; thunder, lightning, and rain on the 7th; fresh snow on Mount Wellington on the 10th.

FRANCIS ABBOTT.

XXX.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE HOBART TOWN REGISTRATION DISTRICT DURING THE MONTH OF DECEMBER, 1871.

By Dr. E. Swarbreck Hall.

The hot and very dry character of this month, together with the excessive daily variations of temperature, might have been expected to cause a death-rate largely above the December average, but the excess was only trifling, three-fourths of the deaths being above 15 years old, children's deaths under the age forming an unusually small proportion of the total deaths, while those above 60 years old were more than one-third of the whole.

Atmospheric pressure mean, 29·790, was only + ·45 above the average. The maximum was 30·174 on the 1st, the minimum, 29·262, on the 12th; the extreme range of the month therefore being ·912 of an inch. The greatest movement of the barometer in any twenty-four hours was a fall of —·513 on the 30th. There were, however, 12 other days on which the variations exceeded one-fifth of an inch.

Wind-force total, 96·51 lbs., was + 9·09 above the average. Winds from the *north west* greatly exceeded those from any other point of the compass both in frequency and force. Many of them, however, were no doubt deflected west winds. Two of them were hot winds. West winds were the next in point of strength, but south-east in regard to number. The strongest wind of the month was on the 31st, when a gale from the west was recorded as having a pressure of 10·42 lbs. to the square foot. There were only 7 *calms* being —5·89 below the average.

Temperature Mean was 65·95 degrees, being + 4·83 above the average. Only one December in the previous 30 years was hotter, *i.e.* 1855, when the mean was 67. The extremes were 98 degrees on the 4th, and 42 degrees in the nights of the 13th and 27th. The *wet-bulb thermometer* had the mean of 57·35, being + 2·37 above the average.

Daily range of temperature, 23·13 degrees, was + 3·22 above the average, and was only exceeded in the previous 30 years by December 1857, when 25·50 was recorded. The greatest range of any twenty-four hours was 41 degrees on the 30th.

Solar Intensity mean, 107·74 deg., was + 3·77 above the average, and only once exceeded. The hottest record was 132 deg. on the 4th. In December 1859 one deg. higher was registered. The highest ever recorded here for any month was in February 1857, when it was 143 deg.

Terrestrial Radiation mean, 48·44 deg., was only + ·20 above the average. The minimum was 36·5 in the night of the 27th. It is one of the pleasant peculiarities of the weather in Tasmania, that cool nights generally prevail even when the days are unusually hot.

Elastic-force of vapour mean, 380, was + 28 above the mean, and higher than any December since 1860 when it was 392. It ranged from maximum 589 on the evening observation of the 8th, to minimum 165 on the morning of the 25th. This range was unusually great.

Humidity mean, 59, was—9 below the average—only in the first year (1841) of the 30 years' series of meteorological records was humidity less, *i.e.*, 56.

Rainfall, ·53 of an inch, was—1·20 below the average. In five Decembers out of the preceding 30 there have been less rainfalls than in this, and in one the same. On only one day, the 8th, was there rain enough to flush the drains, &c.—a thunderstorm. The rain fell on 5 days being —7 below the average. No *snow* on Mount Wellington during the month.

Spontaneous Evaporation was 3·99 inches.

Cloud mean, 5·82, was + ·21 above the average.

Ozone mean, 7·22, was + ·03 above the average showing, in the absence of the usual fall of rain, that many of the winds recorded north west were really ozone-bearing winds from the sea, and so maintaining a purity of the atmosphere counteracting other atmospheric phenomena adverse to health and life.

Electricity had 20 positive indications, with tension ranging from 3 to 8;

negatives 40, with tension from '2·5 to 8, and 1 nil. There was a smart *thunderstorm*, with *lightning* and heavy rain, on the 8th.

The *deaths* during the month were 46, being $+ 1^{13}/_{14}$ only above the average. December 1870 had 10 less. Under 1 year old there were 7 deaths, being the same in number as 1870; from 1 to 5 years old there were 4 deaths, exactly the same as in 1870. At 5 to 10 there were no deaths; from 10 to 15 none, while December 1870 had 2; at 15 to 20 there was 1 death, 1870 had 2. It thus appears that in this month there were 12 deaths only under 20 years old, while in 1870 there were 15. From 20 to 60 years there were 17 deaths, being 5 more than in 1870. At 60 years old, and all ages above, there were 17 deaths, the oldest being 85; while 1870 had only 9, the oldest being 79. In the *zymotic* class of diseases there were 6 deaths, all cases of infantile diarrhœa. In the *constitutional* class there were 4 deaths from *Consumption*, one a native of Tasmania. One death from *Cancer* of the mouth. In the *Diseases of the Brain and Nervous System* there were 7 deaths, 1 recorded as idiopathic tetanus, 3 apoplexy, 1 hydrocephalus, 1 convulsions, 1 diseased brain. In December, 1870, there were 5 deaths in this class, one being from tetanus. In Diseases of the Heart &c., there were 2 deaths; in Diseases of the Lungs, &c., 9, all being of a chronic character except 2. There were 4 *inquests*, one of them a death in Hospital. In Hospital there were 11 others. At the Cascades a child aged 15 months died in the gaol, registered bronchitis. Three men died in the Invalid Asylum aged 67, 81, 85. At the Brickfields Invalid Asylum there were 2 deaths aged 63 and 76.

In all 1871 there died in the Hobart Town registration district 507 individuals, being only 7 more than in the previous year, but 53 less than the average of the previous 14 years. In the first quarter the deaths were 140; in the second quarter 113; in the third 123; in the fourth 131; as usual the autumn and winter quarters having the smallest mortality.

The *Births* registered in all Tasmania during 1871 were 3,053, being one less than in the previous year. The *Deaths* registered were 1,350, being 54 less than in 1870, and about 13¾ per 1,000 of population, being somewhat less than the death rate in the healthiest of the English registration districts, notwithstanding a greater proportion relatively of very young and very old in the population of Tasmania when compared with that of England and Wales.

JANUARY, 1871.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		Rain in inches.
	Highest.	Lowest.	Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	
	In.	In.	°	°	°	°			
1	29·862	29·763	76	46	112·0	41·0	NW SE	1·30	
2	29·612	29·497	71	47	107·0	46·0	NW SW	8·33	0·08
3	29·919	29·906	71	40	111·5	36·0	NW NE NW	5·20	
4	29·994	29·859	69	50	98·0	47·5	NW SW NW	·52	
5	30·197	30·165	74	44	112·0	41·0	NW SE	1·04	
6	30·151	30·049	77	52	112·0	48·0	NW SE	1·04	
7	30·065	30·025	77	56	112·5	55·5	N SE	1·04	
8	29·947	29·943	78	58	111·0	51·0	NE SE NE	·78	0·05
9	29·813	29·667	96	62	126·0	53·5	NW SE	8·12	0·21
10	29·719	29·685	77	60	84·5	59·0	NW SW	·78	1·10
11	29·915	29·871	71	43	110·0	40·5	SW SE	1·04	
12	29·991	29·963	75	46	110·0	43·0	SW SE	1·30	
13	30·028	30·005	69	53	72·0	51·5	SW NE SE	·26	
14	29·960	29·762	82	59	119·0	56·0	NW SE	1·30	
15	29·857	29·841	81	60	93·5	59·0	SE	1·56	
16	29·664	29·451	92	62	124·0	60·0	NW	5·99	0·23
17	29·559	29·364	86	56	120·0	51·5	NW SE NW	5·73	
18	29·941	29·818	77	55	116·0	52·0	SW SE S	1·30	
19	29·945	29·873	76	50	114·0	46·5	NE SE	1·04	
20	29·960	29·865	77	58	115·0	53·0	NW SE	1·04	
21	29·672	29·425	85	55	122·5	53·0	N SE	·52	
22	29·477	29·170	84	59	105·0	62·0	SW	10·41	0·05
23	30·065	30·034	80	49	109·0	46·0	S SE	1·30	
24	30·381	29·982	77	47	117·0	43·0	SW SE	1·30	
25	30·044	29·967	78	57	115·0	56·0	NW SE	1·04	
26	29·760	29·514	85	58	118·0	56·5	SW SE	2·86	
27	29·818	29·799	80	55	115·0	54·0	NW	7·80	
28	29·983	29·825	80	53	115·5	49·0	NE SE	1·56	
29	29·612	29·591	82	59	119·0	56·0	NE NW	5·20	
30	29·747	29·661	76	56	110·0	51·0	SE NE	·78	
31	29·617	29·517	80	55	117·0	50·5	NW W NW	1·04	
Monthly Mean 29·822			66·81		111·06	50·60	Total Force 77·52		1·72

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Guage. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few standard plants in the Royal Society's Garden during the month.

8th.—First apricot gathered (Roman).
11th.—Jargonelle pear ripe.
12th.—Veronica angustifolia in flower.
15th.—Grevillea robusta in full flower.
18th.—Mulberries commencing to ripen.

Barometer mean, 29·822in., being 0·95in. below the average.
Temperature mean, 66·81°, being 0·03° below the average.
Solar intensity mean, 111·06°, being 1.42° above the average.
Dew point mean, 52·6°, being 2·05° above the average.
Humidity of air mean, ·64, being ·03 per cent. below the average.
Elastic force of vapour mean, ·419, being ·046 per cent. above the average.
Total amount of rain, 1·72in., being 1·36in. above the average.
Increase of spontaneous evaporation on rainfall, 3·80in.
Mean amount of ozone, 7·09, being 0·22 of chromatic scale above the average.
Electricity active on the 1st, 2nd, 4th, 11th, 12th, 18th, 19th, 23rd, and 24th. Thunderstorm on the 8th.

FRANCIS ABBOTT.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE HOBART TOWN REGISTRATION DISTRICT DURING THE MONTH OF JANUARY, 1872.

BY E. SWARBRECK HALL.

The meteorology of this month is quite peculiar, and had not some of the phenomena most adverse to health and life been counteracted by others of the opposite character, the health of the community would have been seriously affected, and the death-rate have been much in the excess of the 15 years' mean for January. As it was, the excess of deaths is scarcely appreciable, being only the fifteenth of one, and no epidemic disease became prevalent.

From the commencement of this year the meteorological standard of comparison for my monthly notes will be (in most of the phenomena) for 30 years instead of for 25 years as before. By the conjoint labours of Mr. Francis Abbott, F.R.A.S., Mr. Roblin, Curator of the Royal Society's Museum, and myself, tables for the longer period have been compiled, thus extending our Meteorological Records from 1841 to 1870 inclusive. They will soon be in the hands of the Government printer, and available for all interested in the subject.

Atmospheric-pressure mean, 29·822, was only + ·078 above the 30 years' mean. The maximum, 30·381, occurred on the 24th, the minimum, 29·170, on the 22nd, so that the whole range of the month was 1·211 inches, and recorded within two days. This is by far the highest range in any January since 1855, except 1856. Between the morning observations of the barometer on the 22nd and 23rd the mercury rose + ·864 of an inch. In January, 1856, it was 1·014, but no other January approached to anything near that of the present month. On 13 other days the variations of atmospheric-pressure were above one-fifth of an inch. The lethal influence of this, conjoined with great heat, and wide alterations of temperature, was exemplified in the heavy death-rate from diseases of the brain, &c.

Wind-force total, 77·52 5· lbs., was + 176 lbs. above the mean. The ozone-bearing, health-promoting, gentle sea breezes from the South East were the greatest in number, but those of the opposite character from the North West were the greatest in force. The four strongest winds recorded had 5·21 lbs. pressure to the square foot each, three were from the North West on the 2nd, 16th, and 17th, the other a South West on the 22nd, when the barometer attained its minimum. Hot winds were recorded on the 9th, 16th, 21st, 22nd. *Calms* were 19, being — 2·10 below the average.

Temperature mean, 66·81 degrees, was + 4·12 above the 30 years' mean for January. Only January 1856 had a higher mean, *i.e.*, 71·10. The greatest high-day temperature was 96 degrees on the 9th. The smallest low-night temperature was 40 degrees on the 3rd, giving the extreme range for the month of 56 degrees, the same as in the month of December preceding. Only January 1849 had a wider range, the maximum being 105—(the highest ever recorded here)—the minimum 43. The *wet bulb* thermometer mean was 59·31 degrees, being + 3·41 above the 30 years' standard.

Daily range of temperature had the mean of 25·00 degrees, being + 4·36 above the 30 years' standard average. Three years only had higher means, *i.e.*, 1862, 25·03; 1856, 25·13; 1841, 25·50. The greatest range in any twenty-four hours was 34 degrees on the 9th.

Solar intensity mean, 111·06, was + 3·04 above the mean of the 15 years recorded in the standard tables. The years 1856, 1857, 1862 only had higher means. The maximum was 126 degrees on the 9th, this has been exceeded in nine years out of the 15.

Terrestrial radiation mean, 50·60 degrees, was — ·10 below the 15 years' average. The maximum was 62 degrees in the night of the 22nd, the minimum 36 degrees in the night of the 3rd.

Elastic force of vapour mean, 419, was + 46 above the 30 years' average. In only three years was this mean exceeded, *i.e.*, in 1856, 1859, 1861. The range of the month was from minimum 214 on the morning of the 3rd, to maximum 675 at 1 p.m. on the 16th.

Humidity mean, 64, was —3 below the 30 years' standard.

Rain fell to the aggregate amount of 1·72 inches, which is + ·15 of an inch above the 30 years' mean for January. The greatest part of it (1·31 inches) was precipitated in 26 hours following the hot-wind on the 9th. This was a most beneficial event on sanitary grounds, as it gave a thorough cleansing to the gutters, drains, sewers, &c., which, from the previous long continued dry weather, were full of decomposing organic matters, and very offensive. The death records give one instance at least of the effects of such filth accumulations; a boy of 16 died in Hospital from Pythogenic or Typhoid fever, or more expressively *filth-fever*, taken from a bad street in the centre and lower part of the city. Every year's delay in properly sewering the city is causing an increased saturation of the soil with the seeds of this and other zymotic diseases, as well as adding to the ultimate expense which will be entailed upon the citizens. Fortunately our water supply is not liable to be contaminated with the soakage of these pestilential products, but it behoves every family to pay great attention to their water butts and cisterns, for the dust which is so great in dry windy weather is loaded with animal ordure and other organic matters, and settles abundantly in the uncovered receptacles of water, and there rapidly ferments and decomposes. Every water-cask ought to be thoroughly cleansed at least once a week. I demonstrated to the Royal Society some years ago how full of living creatures water long stored in casks, &c., became. Our mountain supply of water could not at its origin be of a purer quality; but no pains or expense should be spared to deliver it uncontaminated to the citizens. Too much obnoxious dust settles in the reservoirs at the Cascades, and even in the covered one in Hill-street, owing to the opening in the latter's gables not being screened with gauze wire as I long ago suggested should be done. The proposal before the Municipal Council to convey the water from the "Springs" to the "bower" in pipes, instead of the open channels, is in every sanitary respect highly desirable, but there should be no union of different metals in their construction. Nevertheless, I must repeat what I have said heretofore, that since the new waterworks came into operation deaths from Diarrhœa in the city have been much diminished, though liable to augment again from the increasing accumulations in the vile cess-pits and cloacæ so prevalent in the city. The dread penalty paid by so many towns in Great Britain for this sort of sanitary neglect and mismanagement ought to warn the authorities of all the young cities and towns of the southern hemisphere, how they overlook these most important matters. Pure as is the air we receive in our happily situated island, it can, and will be polluted by local neglect of scavenging, sewering, and ventilating, and human lives will have to pay the penalty of such want of hygienic forethought. The rain fell on 6 days, which is — 2·93 below the average of 16 years.

Snow was never seen on Mount Wellington this month.

Spontaneous Evaporation amounted to 5·52 inches, thus far exceeding precipitation, as was sure to be the case with so much wind and heat.

Cloud mean, 4·92, was — ·82 below the average.

Ozone had the mean of 7·09, which is + ·16 above the January average for the 13 years of the new standard tables. On four observations saturation (10) was recorded.

Electricity had 23 positives with tension from 3 to 8·5, and 32 negatives with tension from 1·5 to 5·5. Nils were 7. *Thunder* and *lightning* were observed on the 8th.

There were 50 *deaths* during the month, being + $^1/_{15}$ above the January average for the previous 15 years, and only + 3 more than 1871 had. Under one year old there were 18 deaths—being one only more than January 1871 had. From 1 to 5 there were 4 deaths; 1871 had not any. From 5 to 10 one death; 1871 also one. From 10 to 15 no deaths; 1871 the same. From 15 to 20 two deaths; 1871 none. From 20 to 60 there were 18 deaths, being + 4 more than in 1871. At 60 and all ages above, the oldest being 94, there were only 7 deaths, while 1871 had 15. In the *Zymotic* class of diseases there were 13 deaths, being + 7 more than in the previous month, December 1871. Typhoid fever 1; croup 1; erysipelas 1; pyœmia, after wound in the hand 1; diarrhœa 9, mostly very young infants. In the *Cachectic* or constitutional class there were 7 deaths, 2 of them from *Consumption*, one of them a girl of 20 being a native of Tasmania, the other a sailor from a ship in harbour, a half-caste native of New Zealand, aged 24. In *diseases of the brain and nervous system* there were

14 deaths, being twice as many as in the previous month of December. In *diseases of the heart*, &c., only one death. In diseases of the *lungs*, &c., only one, which is remarkable with such wide daily ranges of temperature, and verifying the remark I have often had occasion to make, that mere alterations of temperature do not cause diseases of the organs of respiration to the extent that they do in the British Isles. In the other classes there was nothing unusual. In the *Hospital* there were 13 deaths, 5 of them not belonging to the Hobart Town registration district. There was only one *Inquest*, a suicide from poisoning with strychnine. At the *Cascades Invalid Asylum* there was only one death of a man aged 94, but a child of one of the officers of the House of Correction there died at the age of 4 months, as its fellow-twin did on the 24th of December previous, but which was not entered into my report for that month, as the death was not registered until the 11th January, notwithstanding the penalty the Act provides for such neglect. At the *Brickfields Male Invalid Asylum* there were two deaths, one aged 75 the other 77.

FEBRUARY, 1872.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of Month.	Bar. 37 feet abv. sea level corrected & reduced.		Self-Registering Thermometers.				Wind.		Rain in Inches
	Highest.	Lowest.	Highest in shade.	Lowest in shade.	Highest in sun.	Lowest on grass.	Direction from three daily registers.	Force in lbs. per square foot.	
	In.	In.	°	°	°	°			
1	29·926	29·833	75	50	115·5	40·5	SE	·78	
2	29·694	29·602	71	51	108·0	46·0	NW SW	3·65	
3	29·980	29·799	72	40	113·0	34·0	NW NE S	1·30	
4	29·706	29·660	71	49	112·0	44·5	NW SW W	5·73	
5	30·013	29·934	67	48	1[illegible]0·0	43·0	NW SE	1·04	
6	29·979	29·744	72	52	95·0	50·5	SW NE SW	·52	
7	29·439	29·409	73	50	106·0	46·0	NW W	5·99	0·11
8	29·899	29·753	71	43	103·0	39·5	NW	·52	
9	29·836	29·810	80	58	114·0	51·0	NW	3·65	
10	30·076	29·968	81	55	117·0	51·5	NW SE	1·56	
11	30·068	29·947	80	52	112·5	47·0	NW SW SE	1·30	
12	29·827	29·821	77	53	85·0	53·5	NW SE	1·30	0·15
13	30·068	30·036	72	44	110·0	40·0	NE SE	1·04	
14	30·052	30·003	76	48	112·0	45·0	NW SE	1·30	
15	30·266	30·159	75	51	110·0	46·5	SE	1·56	
16	30·294	30·178	82	53	116·0	49·5	NW SE	1·04	
17	30·140	30·099	71	59	86·0	58·5	NW E SE	·78	0·07
18	30·163	30·122	66	57	80·0	55·5	SE	·26	0·01
19	30·130	29·962	83	58	118·5	57·5	NW NE	1·04	
20	29·841	29·653	81	66	95·5	65·5	NW W	1·30	0·50
21	29·852	29·774	79	53	86·0	49·5	SE	1·30	
22	30·047	29·945	74	44	90·0	40·5	NW SE	1·04	
23	30·178	30·123	79	52	118·0	50·0	NW SE NE	·78	
24	29·968	29·794	80	54	102·0	51·5	NW SE	1·56	0·57
25	30·060	29·947	76	49	107·0	43·5	NW SE SW	1·30	
26	30·225	30·178	79	51	118·0	43·5	NW SE	3·38	
27	30·429	30·423	75	51	115·0	44·5	NW SE	1·04	
28	30·369	30·110	89	56	121·5	49·5	NW SE	1·30	
29	30·214	30·116	86	60	120·0	52·0	SE	1·04	
Monthly mean 29 974			63·69		106·48	47·64	Total force	48·38	1·41

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet and the force according to Lind's Wind Gauge. The supposition, however, of a uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The 25 years' standard tables are used for obtaining the difference from the average.

Leafing, Flowering, and Fruiting of a few Standard Plants in the Royal Society's Gardens, during the month.

4th.—Kerry pippin apple commencing to ripen.
5th.—Windsor pear commencing to ripen.
10th.—Bon Chretien pear commencing to ripen.
14th.—Green gage commencing to ripen.
24th.—Ash commencing to shed seed
25th.—Sycamore commencing to shed seed.

Barometer mean, 29·974in., being 0·143in. above the average.
Temperature mean, 63·69°, being 1·81° above the ditto.
Solar intensity mean, 106·43°, being 1·44° below the ditto.
Dew point mean, 48·38°, being 2·17° below the ditto.
Humidity of air mean, ·66, being ·04 per cent. below the ditto.
Elastic force of air mean, ·386, being ·012 above the ditto.
Total amount of rain, 1·41in., being 0·28in. below the ditto.
Increase of spontaneous evaporation on rainfall, 2·68in.
Mean amount of ozone, 7·16, being 0·15 of chromatic scale above the ditto.
Electricity moderately active on the 1st, 2nd, 3rd, 4th, 5th, 8th, 10th, 14th, and 28th.
Squally on the 7th, with fresh snow on Mount Wellington.
Aurora Australis on the 12th.

FRANCIS ABBOTT.

xxxvii.

NOTES ON THE METEOROLOGY AND MORTALITY OF THE HOBART TOWN REGISTRATION DISTRICT DURING THE MONTH OF FEBRUARY, 1872.

BY E. SWARBRECK HALL.

Warm days, cold nights, numerous and gentle sea breezes with plenty of ozone, nearly an average of rain-fall, but mostly precipitated on two days, five days apart, though with atmospheric pressure high and variable, and temperature above the average, was conducive to the health of the community above five years old, the deaths at all ages being considerably less than the average of the previous 15 years.

Atmospheric-pressure mean, 29 974, was + ·132 above the 30 years' adopted standard average for February. The range of the month was 1·019 inches; the minimum 29·409, noted on the 7th; the maximum, 30·428, on the 27th. The greatest movement of the barometer in any 24 hours was a rise of + ·487 of an inch on the 8th. On twelve other days there were movements exceeding one-fifth of an inch. The influence of these mutations of atmospheric pressure is visible in the deaths under "Diseases of the Brain," &c., and of the "Heart," and "old age," which altogether were 15 out of the total, from all causes, of 40.

Wind-force total, 48·38 lbs., was —6·34 below the average, but south-east sea breezes laden with ozone were not only unusually numerous, but prevailed over winds from all other points of the compass, both in frequency and force. The strongest winds had 5·21 lbs. pressure to the square foot, and were recorded at noon on the 4th from the south-west, and at sunset on the 7th from the west. No *hot winds*. *Calms* were 16 only, being – 1·67 below the February average. Moderate, constant, and pure breezes from the best points of the compass therefore characterised this month.

Temperature mean, 63·69 degrees, was + 1·58 above the 30 years' average for February. The extremes were maximum high-day temperature, 89 degrees, on the 28th, and minimum low-night temperature, 40 degrees, in the night of the 3rd. The mean of all the maxima was 76·31 degrees, the mean of all the minima being only 51·97 degrees, and the highest of the minima but 60 degrees. Warm days and cool nights were therefore characteristic of this month. The *wet-bulb thermometer* mean was 56·79 degrees, being + 1·08 above the average.

Daily range of temperature, 24·34 degrees, was + 4·53 degrees above the 30 years' average. Only the first year of the series—1841—had so high a mean, *i.e.*, 24·30. The highest range on any day was 33 degrees on the 28th, that being the extreme range between the hottest part of the day in the shade, 89 degrees, to the coolest record in the following night, 56 degrees.

Solar intensity mean, 106·43 degrees, was — 1·17 below the average. The highest record was made on the 28th, being 121·5 degrees only. Twice in 16 years only have there been lower records.

Terrestrial radiation mean, 47·64 degrees, was — 2·03 degrees less than the average, giving still stronger proof of the cool nights than the self-registering minimum air-thermometer did. The coldest night was the 3rd, when the thermometer sank to 34 degrees. On the night of the 20th this thermometer marked 65·5, being only half a degree less than was marked by the air-thermometer.

Elastic force of vapour mean, 386, was + 11 above the average. The range was from 224 minimum on the morning of the 3rd, to 641 maximum at noon on the 20th.

Humidity mean, 66, was — 4 less than the average.

Rain fell to the amount of 1·41 inches, which is only — ·12 below the average. It was recorded on 6 days, being — 2·93 days below the average. On the 20th half an inch fell, and on the 24th a little more, *i.e.*, ·57 of an inch. These two events were highly salutary in scouring the water courses, sewers, &c., of decomposing organic matters. *Snow* fell abundantly on Mount Wellington on the 7th, and did not disappear until some hours after sunrise on the 8th.

Spontaneous evaporation amounted to 4·09 inches.

Cloud mean, 5·67, was only + ·04 above the average.

Ozone mean, 7·16, was but —·01 below the average. Saturation (10) was registered 5 times.

Electricity had 17 positives with tension ranging from 3·5 to 6, and 35 negatives with tension from 2 to 7, and 6 nils. Neither *thunder* nor *lightning* were observed. An *Aurora* was seen on the evening of the 12th.

The *Deaths* numbered 40 only, being — 13$^{3}/_{15}$ less than the average of the previous 15 years. Only February 1867 had fewer, *i.e.*, 34, and 1860 had 40 also. The highest February was that of 1859, *i.e.*, 75. Two of the deaths were in visitors from Victoria. Under one year old there were 13 deaths; from 1 to 5 there were 4; from 5 to 10 none; from 10 to 15 there were 2; from 15 to 20 there was 1. Thus exactly half the deaths of the month were under 20 years old. From 20 to 60 there were only 7 deaths, at 60 and all ages above there were 13, the oldest being a man aged 100 who had been in these colonies 67 years, and whose death was caused by the *accidental* fracture of his thigh-bone.

In the *Zymotic* class of diseases there were 13 deaths, all from bowel complaints at and under twelve months old. By the new Nomenclature of Diseases of the Royal College of Physicians of London now generally adopted, Diarrhœa, which constituted 11 out of the 13 cases, would be classed under diseases of the Digestive System amongst diseases of the intestines, and not under the head of "Miasmatic" or "General Diseases." During the summer months in Tasmania, diarrhœa always prevails with more or less fatality amongst young children, and occasionally as an epidemic. In the *Cachectic* or *Constitutional* class of diseases there were 5 deaths, 4 from *cancerous* affections of various organs, one from *Consumption*, a man aged 27 born in Tasmania. In diseases of the *Brain and Nervous System* there were 9 deaths; in diseases of the *Heart*, &c. 2; in the *Lungs*, &c., only 1; *Stomach*, &c., only 1; *Urinary* organs, 1; *bones*, &c., 1; *developmental*, 1; *old age*, 4; *violence*, 2. There were no Inquests. In the *Hospital* there were 11 deaths, one belonging to another registration district. At the *Cascades* establishment a man aged 81 died. At the *Brickfields Invalid Asylum* 3 men died, aged respectively 60, 72, 81.

REPORT

OF THE

ROYAL SOCIETY

OF

TASMANIA,

FOR THE YEAR

1871.

TASMANIA:
PRINTED AT THE "MERCURY" STEAM PRESS OFFICE, HOBART TOWN.

1872.

PATRON:

Her Majesty

The Queen.

Royal Society of Tasmania.

Patron:

HER MAJESTY THE QUEEN.

President:

HIS EXCELLENCY CHARLES DU CANE, Esq.

Vice-Presidents:

VEN. ARCHDEACON DAVIES
HON. SIR R. OFFICER, M.H.A.
J. W. AGNEW, Esq., M.D.
M. ALLPORT, Esq., F.L.S., F.Z.S., C.M.A.I.

Members of Council:

*VEN. ARCHDEACON DAVIES
*HON. A. KENNERLEY, Esq., M.L.C.
*M. ALLPORT, Esq., F.L.S., F.Z.S., C.M.A.I.
*J. W. AGNEW, Esq., M.D.
F. ABBOTT, Esq, F.R.A.S., F.R.M.S.
T. GIBLIN, Esq.
JUSTIN McC. BROWNE, Esq.
A. G. WEBSTER, Esq.
SIR ROBT. OFFICER, KNT., M.H.A.
T. STEPHENS, Esq., M.A.
H. J. BUCKLAND, Esq.
J. BARNARD, Esq.

Treasurer:

J. DUNN, Esq.

Hon. Secretary:

J. W. AGNEW, Esq., M.D.

Auditors of Annual Accounts:

F. BUTLER, Esq.
H. COOK, Esq.

Auditors of Monthly Accounts:

M. ALLPORT, Esq.
F. ABBOTT, Esq.

Curator of the Museum:

MR. T. ROBLIN.

* Members who retire next in rotation.

Honorary Members.

HIS EXCELLENCY SIR GEORGE GREY, K.C.B., &c., Governor

CHARLES JOSEPH LATROBE, Esq., England.

Corresponding Members.

W. H. ARCHER, Esq., Registrar-General, Melbourne, Victoria.
JOHN JOSEPH BENNETT, Esq., F.R.S., British Museum, London.
REV. W. B. CLARKE, M.A., F.G.S., &c., Sydney.
JOHN GOULD, Esq., F.R.S., London.
JOSEPH DALTON HOOKER, Esq., M.D., R.N., F.R.S., &c., London.
JOSEPH H. KAY, Captain R.N., F.R.S., Melbourne, Victoria.
REV. R. L. KING, B.A., Sydney.
J. MITCHELL, Esq , Sydney.
BARON F. VON MUELLER, C.M.G., M.D., F.R.S., F.L.S., &c., &c., Government Botanist, Melbourne, Victoria.
JOHN PEET, Esq., Professor, Grant's College, Bombay.
FREDERICK PENNY, Esq., F.R.S., Professor of Chemistry in the Andersonian University, Glasgow.
W. J. MACQUORN RANKIN, Esq., C.E., F.R.S.L., and E., &c.
W. WILSON SAUNDERS, Esq., F.R.S,, &c., London.
ALFRED R. C. SELWYN, Esq., F.G.S.
REV. CHARLES PLEYDELL N. WILTON, M.A., Newcastle, New South Wales.
ADAM WHITE, Esq.. F.L.S., &c., British Museum, London.
E. S. P. BEDFORD, Esq., F.R.C.S.L., Sydney, New South Wales.
C. TOMLINSON, Esq., F.R.S., F.C.S. &c., Highgate, near London.
G. BENNETT, Esq., M.D., F.Z.S., Sydney, New South Wales.
PROFESSOR G. NEUMAYER, Munich.
REV. JULIAN E. T. WOODS, F.L.S., F.G.S., F.R.G.S., &c., Penola, South Australia.
DR. W. O. SONDER, Foreign Hon. Sec. Society of Naturalists, Hamburg.
REV. J. J. BLEASDALE, D.D., F.G.S., Melbourne.

List of Fellows.

† Denotes Life Membership.

Abbott, Francis, F.R.A.S., F.R.M.S.	Hobart Town
Abbott, F., jun.	,,
Adams, G. P.	,,
Agnew, J. W., M.D.	,,
Allport, Joseph	,,
Allport, Morton, F.L.S., F.Z.S., C.M.A.I.	,,
Archer, William, F.L.S.	Cheshunt
Atherton, E.	Hobart Town
Atkinson, Rev. H. D.	Oyster Cove
Aubin, F.	Spring Bay
Aikenhead, Hon. J., M.L.C.	Launceston
Adams, R. P., Solicitor-General	Hobart Town

Bilton, H.	Glenorchy
†Barry, Sir R., Puisne Judge	Melbourne
Barnard, James	Hobart Town
Butler, Francis	,,
Butler, J.	,,
Bromby, Right Rev. C. H., Lord Bishop of Tasmania	,,
Bright, R. S., M.R.C.S.L.	,,
Butler, Hon. Henry	,,
Buckland, H. J.	,,
Browne, Justin McC.	,,
Baynton, W. E.	Kingston
Bomford, F. E.	Rheban, Swansea
Bailey, Rev. Brooke	Hobart Town

Chapman, Hon. T. D., M.H.A.	New Town
Cook, Henry	Hobart Town
Clarke, J. M.	,,
Creswell, C. F.	,,
Cotton, Francis	Swanport
Crawford, Lieut.-Colonel	Hamilton-on-Forth
Crosby, W.	Hobart Town
Crowther, W. E.	,,
Creasy, R. J.	,,

Cruttenden, Thomas	Woodsden
Castray, L. R., A.C.G.	Hobart Town
Davies, Ven. Archdeacon	Hobart Town
Davies, John, M.H.A.	,,
Dear, Rev. R. E.	,,
Dobson, His Honor Mr. Justice	,,
Dunn, Hon. J. A.	,,
Du Cane, His Excellency Charles	Government Houes
Dobson, H.	Hobart Town
Foster, Hon. John, M.L.C.	Hobart Town
Fysh, Hon. P. O., M.L.C.	,,
Giblin, Thomas	,,
Gould, C., F.G.S., late Government Geologist	,,
Gorringe, Thomas	Green Ponds
Greig, C. C.	Hobart Town
†Gunn, R. C., F.R.S., F.L.S.	Launceston
Graves, J. W.	Hobart Town
†Gellibrand, W. A. B.	River Ouse
Hall, Dr. E. Swarbreck	Hobart Town
Harris, Rev. R. D. P., M.A.	,,
Hunter, Henry	,,
Huston, G. F.	New Norfolk
Huybers, A.	Hobart Town
Hopkins, H.	,,
Hazell, C.	Carlton
Howell, F. G.	Hobart Town
Irving, M.H., M.A., &c.	Melbourne
Irvine, P.	Hobart Town
Isaacs, R. McIntosh	Hobart Town
Jackson, Adam	Ross
Jamieson, Mr.	Hobart Town
†Jeffery, Molesworth	Bournbank, Lachlan
Jackson, J. A., M.H.A.	Hobart Town
Kennerley, Hon. Alfred, M.L.C.	Hobart Town

Knight, W., jun.	Sandy Bay
Kermode, W. A.	Mona Vale

Lewis, David, M.H.A.	Hobart Town
Legge, R. V.	Cullenswood

Maclanachan, James	Ballochmyle
Macfarlane, James	Hobart Town
Macfarlane, J.	,,
Mather, J. B.	,,
Maxwell, C. M.	,,
†Milligan, Joseph, F.L.S.	England
Moore, J. A.	New Norfolk
Meredith, Hon. C., M.H.A.	Hobart Town
Morrison, Askin	,,
Marsh, H. J.	,,
Mace, J. C.	Clarence Plains
Mace, G.	Spring Bay

Napier, G. R.	Hobart Town
Nelson, H.	,,

Officer, Hon. Sir Robert, M.H.A., Speaker	New Norfolk

Roberts, H. L.	Hobart Town
Read, R. Cartwright	Redlands, New Norfolk.
Rule, J.	Bellerive
Riddoch, A.	New Norfolk
Ross, R. J.	Hobart Town

Salier, G., M.H.A.	Hobart Town
Sharland, W. S., M.H.A.	New Norfolk
Solomon, Joseph	Hobart Town
Stephens, T., M.A., Inspector of Schools	,,
Story, J. F.	Swanport
Storie, Rev. J.	Hobart Town
Susman, L.	,,
Scott, J., M.H.A.	Launceston
Scott, J. R., M.H.A.	New Town
Salier, F. G.	Hobart Town
Swan, J., M.H.A.	New Town

Smith, P. T.	Ross
Travers, S. Smith	New Town
Walch, James	Hobart Town
Weaver, G.	,,
Whitcomb, G.	Hobart Town
Whyte, Hon. James, M.L.C.	,,
Wilson, George, jun.	Mount Seymour
Wilson, Hon. J. M., M.L.C.	Hobart Town
Wise, F. H.	,,
Wilkins, A.	England
Webster, A. G.	Hobart Town
Wright, Stephen P. H.	,,
Wilson, George	,,
Willes, C. J., M.R.C.S. Edin.	Oatlands
Walker, F. T.	Rhodes
Young, Russell	Hobart Town
Young, James	Bracknell

MINUTES of the ANNUAL GENERAL MEETING of the ROYAL SOCIETY OF TASMANIA, held at the Museum, Macquarie-street, at 7 o'clock p.m., on the 29th January, 1872: Morton Allport, Esq., F.L.S., F.Z.S., C.M.A.I., Vice-President, in the chair.

The CHAIRMAN having read the advertisement by which the meeting had been convened, called upon the Secretary to read the report.

The Report for 1871 was then read.

It was moved by Mr. BILTON, seconded by Mr. GIBLIN, and carried, "That the Report be adopted, and printed for circulation amongst the Fellows."

Messrs. F. Abbott, jun., and C. Belstead, having been appointed scrutineers, the meeting proceeded to the election of four members of Council, in place of those retiring.

The ballot resulted in the re-election of the retiring Members, &c. :—

SIR ROBERT OFFICER.
T. STEPHENS, ESQ.
H. J. BUCKLAND, ESQ.
J. BARNARD, ESQ.

Messrs. F. Butler and H. Cook were, on the motion of Mr. T. GIBLIN, seconded by Mr. F. ABBOTT, senior, re-elected Auditors of annual accounts.

R. J. Ross, Esq., after due nomination, was elected a Fellow of the Society.

Mr. T. GIBLIN observed that the Fellows had great reason to be pleased with the present position of the Society. The debt had been reduced during the past, and was likely to be entirely cancelled by the end of the present year. The general business of the Society had been conducted in a most efficient and satisfactory manner, and for all these matters he was sure everyone present felt they were much indebted to the zeal and attention of the hon. secretary, who had devoted a very great deal of valuable time to the affairs of the Society. He therefore proposed that the best thanks of the meeting should be given to the hon. secretary.

Dr. AGNEW, in returning thanks, expressed the satisfaction he felt in being able to report that the Society was so nearly clear of the debt which had for so long a period embarrassed it. It was not, he said, to be supposed, however, because we had devoted a portion of income to clear off an old debt that we had no other use for it. In fact our income was still far below what it ought to be. Our Museum was increasing, and required increased expense to keep it up. To supplement and explain it also, many valuable works of reference were urgently required for the library, and as soon as we were clear of debt every effort should be made to procure them. He might also allude to the additional accommodation given by the new building, which would greatly facilitate the work of the Museum. More room would be available for the preparation and exhibition of specimens, and on the whole he was glad to be able to congratulate the Fellows on the present state of the Society, which financially and otherwise would bear very favourable comparison with its condition at any former period.

A vote of thanks, on the motion of Mr. CASTRAY, seconded by Mr. BELSTEAD, was accorded to the Chairman.

Mr. ALLPORT having returned thanks the meeting terminated.

REPORT.

“The session of 1871 was opened on the 14th March, when a paper by M. Allport, F.L.S., F.Z.S., entitled ‘Observations on the Progress of the Salmon Experiment’ was read. The following papers were brought forward at the various meetings during the year:—‘Some Remarks on the Geology of Bruni Island,’ by the Rev. H. D. Atkinson: ‘On the Star η Argus and its Nebula,’ by F. Abbott, F.R.A.S., F.R.M.S.; ‘On the Cultivation of the Sugar Beet,’ by F. Abbott, jun., Superintendent of Botanic Gardens; ‘On Sheep Breeding,’ by S. Smith Travers; ‘On a Mode of Poisoning Rabbits on Sheep Runs, &c.,’ by J. Bisdee; ‘On the Geological Structure of Flinders Island,’ by C. Gould, F.G.S.; ‘On the Islands of Bass’ Straits,’ by the same author; ‘On a New Genus of Freshwater Mollusks discovered in Tasmania,’ by W. Legrand; ‘Notes as to recent results arrived at by the Royal Astronomical Society relative to the Fluctuations of the Star η Argus and its Nebula,’ by F. Abbott, F.R.A.S.; ‘On a Process by which Vitality in Eggs (fowls’) may be Preserved for an Indefinite Period,’ by S. Smith Travers.

“In addition to the above papers the following subjects have been introduced and discussed during the session:—“Sericiculture’ (with correspondence); ‘The Cultivation of the Cork Oak in Tasmania’; ‘Stone Alum, from Brook’s Creek, Tasmania’; ‘The Growth and Preparation of Cork in Europe and Africa’; ‘The Management of the Mulberry Tree in China and Japan for Silk Culture’; ‘The Extraction of Sugar from Beet-root'; 'The Destruction of Rabbits in their Burrows,' &c., &c.

"Our monthly meteorological observations have been duly recorded, and the usual interchanges made with the Observatories of all the neighbouring colonies. The thanks of the Society are again due to all those who have so kindly assisted us in making these returns, and to whom special allusion was made in our last report. 'Notes on the Meteorology and Mortality of the Hobart Town Registration District,' by E. S. Hall, Esq., have been regularly received and printed.

"Our usual friendly intercourse with kindred Societies in various parts of the world has been kept up by exchanges of publications. In this respect, however, America has been by far the most liberal contributor to our library, valuable publications having been received not only from the Government, but also from the Smithsonian Institution and various scientific bodies.

COUNCIL.

"No vacancy has occurred during the year. The required list according to rule xxxii., as amended at the general meeting of 1868, has been exhibited in the library for the last fortnight.

FINANCE.

"As was anticipated in last year's report our debt has been greatly reduced during the year, and will, it is confidently expected, be entirely cleared off before the close of 1872.

"The total income from all sources was as follows: Government grant to Museum, £200; to the Gardens, £400; subscriptions, £142; sale of plants, &c., £67 5s. 8d. This, with £30 12s. in the hands of the Superintendent of the Gardens for payment of wages, and £20 expected to be realised from arrears of subscriptions, will give a total of £859 17s. 8d. The expenditure and liabilities, as per balance sheet, amount to £885 12s. 2d., leaving a balance to debit of £25 14s. 6d.

" The current expenditure for the year has again been kept well within the income, as the following figures will show :—

	£	s.	d.
Total receipts from all sources	809	5	8
Total expenditure	781	3	11
Balance for meeting liabilities	28	1	9

GARDENS.

" During the past year a substantial boundary fence has been erected, and about three acres of ground added to the area of the Gardens. The esplanade and sea-wall, the work on which necessarily remained in abeyance during the erection of the fence, are in such a forward state that the labour of a few weeks only is required for their completion. When finished, this portion of the Garden promises to become, as has always been anticipated, exceedingly attractive.

" With a view of improving the main entrance to the Gardens various alterations have been made on the site occupied by the propagating yards, &c. It is expected that this work will be completed before the close of the present year, and it will greatly conduce to the convenience of visitors.

" About two hundred new plants, many of rare merit, were introduced during 1871. From the Royal Gardens, Kew, we received an important consignment of seeds, consisting of 88 Asiatic, 177 American, and 234 European species. Many of these have already germinated, but others requiring previous preparation will not be ready for sowing till the coming autumn.

"A considerable quantity of seed from the Silesian Beet was saved from plants grown in the Gardens. Practical information as to the value of the root for feeding purposes having been made public through the meetings of the Society, a great demand for the seed sprang up as soon as it was known that we had a supply on hand for gratuitous distribution. Upwards of a hundred applicants from various parts of the colony have received supplies, and we may therefore hope that the cultivation of this valuable plant will now be more generally established in public favour than it has ever yet been.

"The number of visitors to the Gardens during the year was estimated at 26,273, or an increase of 4,829 on the previous year.

MUSEUM.

"Our evening meetings have been made additionally attractive by some valuable donations to the Museum. We make special mention of the presentation of a mounted collection of Mammals, Birds, &c., from Europe, South Australia, and New Zealand, by Mr. H. Gomolka. Also of a fine collection of Minerals from the islands in Bass' Straits by C. Gould, Esq., F.G.S.

"From the South Australian Institute Museum, Adelaide, we have received a collection of bird skins, procured during the exploration of the northern territory of that colony.

"Specimens of the arms and war material available for use in the colony have been furnished by the Government for exhibition. These have been placed on a suitable stand in the lower room, and have attracted much attention from visitors.

"The usual and varied work of the Museum has been steadily carried on. This work in future will be considerably facilitated by the acquisition of a large building now on the premises of the Museum. Possession has also been taken by permission of the Government of the cottage formerly the office of the Public Works Department. This affords a very suitable residence for the Curator, and its proximity to the Museum is in many respects convenient.

"The number of visitors during the year was 10,970, being an increase of 2,072 on that of the previous year."

STATEMENT of the Funds of the ROYAL SOCIETY OF TASMANIA *for the Year* 1871.

RECEIPTS.	£ s. d.	£ s. d.
Annual Subscriptions from 81 Members	121 10 0	
Arrears of ditto	10 10 0	
Life Members' composition	10 0 0	
Total Royal Society		142 0 0
MUSEUM.—Grant-in-aid from Treasury	200 0 0	
Total Museum		200 0 0
BOTANIC GARDENS.—**Proceeds of Sale of Plants, Seeds, &c.**	67 5 8	
Grant in-aid from Treasury	400 0 0	
Total Botanic Gardens		467 5 8
1872.—January 18.—Balance overdrawn at Commercial Bank		37 1 4
		£846 7 0

EXPENDITURE.	£ s. d.	£ s. d.
Jan. 17.—Balance overdrawn at Commercial Bank, as per statement for 1870..		61 12 10
Interest on overdrawn account, 1871, as per Bank Book		3 10 3
ROYAL SOCIETY.—Meteorological Instruments	4 11 6	
Printing and Advertising	46 4 11	
Postage, Parcels, &c.	3 14 11	
Collector's Commission on Subscriptions received, £132, at 5 per cent.	6 12 0	
Messenger for delivering Papers and Proceedings ..	1 5 0	
Furniture	1 11 6	
Library, Books, and Stationery	22 18 9	
Total Royal Society		86 18 7
MUSEUM.—Salary of Curator..	125 0 0	
Wages of Attendant	50 3 4	
Premium of Insurance	6 7 6	
Purchase and Preparation of Specimens	8 0 0	
Water Rate	3 2 8	
Fuel and Light	5 1 11	
Sundries and Petty Cash	2 0 0	
Camphor, Spirits of Wine, &c.	8 13 6	
Ironmongery	3 5 3	
Freight and Carriage of Specimens	1 4 0	
Fittings, Repairs, &c.	11 4 4	
Sweeping Chimneys	0 13 6	
Total Museum		224 16 0
BOTANIC GARDENS.—Salary of Superintendent.. ...	150 0 0	
Wages of Foreman, Labourers, &c.	263 4 0	
Tools and Repair of ditto	12 1 8	
Freight and Carriage of Plants	4 9 8	
Stationery and Stamps	1 15 11	
Forage	3 3 0	
Ironmongery	9 13 11	
Repairs, &c.	2 10 0	
Seeds	3 10 6	
Sundries	19 0 8	
Total Botanic Gardens		469 9 4
		£846 7 0

	£ s. d.	£ s. d.
Note.—Dr.—To overdrawn Balance at Bank	37 1 4	
Orger and Meryon, London, Balance due ..	19 5 2	
Wheatley & Co., to 31st December (not received), estimated at	20 0 0	
Total liability..		76 6 6
Cr.—By Cash in hands of Mr. Abbott, Superintendent of Gardens	30 12 0	
Subscriptions due	20 0 0	
Total assets		50 12 0
Balance to debit		£25 14 6

6th February, 1872.

Audited and found correct { **FRANCIS BUTLER,**
HENRY COOK, } **Auditors.**

BOOKS PURCHASED & PRESENTED DURING 1871.

[*Presentations marked thus* *]

Arts, Journal of Society of, Vol. 18, Nos. 937-8; Vol. 19, Nos. 939 to 988.
Arts, Transactions of Society of, Vol. 18; (November 18th, 1869, to November 11th, 1870.)
Athenæum, Parts 514 to 524. October 1870, to August 1871.
*Algæ of Tropical Shores of Australia. By Dr. W. Souder, Hamburg. From the Author.
*Africa, South, and its Resources.
*African Diamond Fields, Guide to.
*Barometer Manuel (Coast), 1870-1871. From the Director, Meteorological Office, London.
*Builder, The, current numbers.
*Bible, Barker's, printed in 1637. From Mr. W. Hatton, Hobart Town.
Conchologia, Iconica, Nos. 284 to 289.
*Census of Victoria, 1871. From Government of Victoria.
*Camphor, Motions of, on Water. By C. Tomlinson, Esq., F.R.S., &c.
Emigrants, Hints to. By H. M. Hull, Esq. From the Author.
Florist and Pomologist, Nos. 35 to 46, November, 1870, to October, 1871.
*Fossil Coniferæ, Observations on a new genus of. By Baron F. Von Müeller, C.M.G., F.R.S., &c., &c. From the Author.
*Fossilen Mollusken des Tertiær-Beckens von Wien. By Dr. M. Hornes. From Geological Society of Vienna.
Gardeners' Chronicle, The, current numbers.
*Humboldt, Address delivered on centennial anniversary of birth of. By Professor Agassiz. From the Boston (United States) Society of Natural History.
*Invertebrata of Massachusetts. By Dr. A. A. Gould. 1 Vol., bound. From the Boston (U. States) Society of Natural History.
*Islands in Bass' Straits, On the. Two Papers by C. Gould, Esq., F.G.S. From the Author.
Journal, Silliman's American, Vol. 50, No. 150. Vol. 1, n.s., Nos. 1 to 6, Vol. 2, Nos. 7, 9, 10.
*Journal, Agricultural of N. S. Wales, Vol 3, Nos. 1 to 11.
Journal, Quarterly of Science, Current Nos.
Journals of House of Assembly, Tasmania, Vols. 19 and 20.
*Journey to Musardu (Africa) .By B. Anderson, Esq., New York. From the Author.
*Journals of House of Commons, 1644.
*Literary Intelligencer, Walch's, Monthly Numbers. From Messrs. Walch and Sons.
Magazine, Country Gentleman's. Vol. 5, Nos. 29-30; Vol. 6, Nos. 31 to 36; Vol. 7, Nos. 38-39.
*Meteorological Returns, New Zealand, for 1869. From the Government of New Zealand.
*——————————, Monthly, September, 1870, to January, 1871. From ditto.
*——————————, Sydney, Monthly. From the Government Observer.
*——————————, South Australia, for 1869. From C. Todd, Esq., Government Observer.
*——————————, Hobart Town, Monthly. From F. Abbott, Esq., F.R.A.S., F.R.M.S.
*——————————, Swansea, ditto. From Dr. G. F. Story.

*Meteorological Returns, Westbury, ditto. From F. Belstead, Esq.

*——————————, Port Arthur. ditto. From A. H. Boyd, Esq.

*——————————, Melbourne, monthly. From R. J. L. Ellery, Esq., Government Astronomer.

*——————————, New Zealand, ditto. From Dr. J. Hector, F.R.S., &c.

Natural History, Annals and Magazine of, Vol. 6, Nos. 35-36; Vol. 7, Nos. 37 to 44. Vol. 8, Nos. 45-46

*——————, Society of Wurtemberg, Annals of, 2 Parts, 1870.
Nature, Vol. 2, Parts 15 to 21.

*New Zealand Institute, Address of President of, 1871. From Dr. Hector.

*————— Flax, Catalogue of Samples of Fibres prepared from. From ditto.

*————— Birds, Catalogue of. From ditto.

Proceedings, Royal Society, London, Vol. 19, Nos. 123 to 129.

*—————, Essex Institute, Salem, Massachusetts, Vol. 6, part 1. From Institute. Also Bulletin of ditto, Vol. 1.

*————— of American Philosophical Society, Vol. 11, No. 82. From the Society.

*————— of American Academy of Arts and Sciences, Boston, Vol. 8. From the Academy.

*Patents, Victorian, Indexes of, Vol. 4. From the Government of Victoria.

*Reports of Mining Surveyors and Registrars Victoria 1870, and first quarter of 1871. From Victorian Government.

*———— Quarterly Weather, Parts 2, 3, 4, 1869; Parts 1-2, 1870. From the Meteorological Office, Board of Trade, London.

*———— of Meteorological Committee of Royal Society, London 1868-9-70. From ditto.

*Report of Inquiry into connection between High Winds and Barometrical Differences, 1869. From ditto.

*———— on Meteorology of North Atlantic. By Captain Toynbee, F.R.A.S. From ditto.

*———— on use of Isobaric Curves. By the same Author. From ditto.

*———— on Barracks and Hospitals, American. By the Surgeon-General, U. S. Army. From the United States Government.

*———— Annual, of Department of Agriculture, U. S. America, 1868. From the Department.

*————, 3rd, of Commissioners of Fisheries, State of Maine, 1869. From the United States Government.

*————, of Superintendent of United States Coast Survey, 1866. From the U. S. Government.

*————, Monthly, of Deputy Commissioner of Revenue, United States, 1869. From the Government, U.S.

*———— of British Association, 1869. From the Association.

*Statistics of Victoria, 1869 and 1870. From W. H. Archer, Esq.

*————————, Mineral, 1870. From R. Brough Smythe, Esq.

*Salmonidæ, History of Introduction of into Tasmania, by M. Allport, Esq., Esq., F.L.S., F.Z.S. From the Author.

*————————————————————, Additional Notes on. By the same Author.

*Society, Royal Asiatic, Journal of, Vol. 4, Part 2; Vol. 5, Part 1.

*———, Royal Geographical, Journal of, Vol. 39, 1869. From the Society.

——————————————, Proceedings of, Vol. 14, Nos. 2, 3, 4, 5. From ditto.

*Society, Geological of London, Quarterly Journal of Vol. 26, parts 1 to 4, Vol. 27, Part 1.

————————————, List of 1870. From the Society.

*———, Zoological of London, Proceedings of, 1869. Parts 2 and 3.

*———, Linnean, Journal of, Vol. 10, No. 48, Vol. 11, Nos. 49 and 50 *(Zoology.)*

*——————————, Vol. 11, Nos. 53, 54, 55 *(Botany)*.

*——— ———, Proceedings of 1869-70, 1870-71.

*——————, Additions to Library, 1869-70.

*———, Italian Geographical, Bulletin of, Vol. 6, 1871.

*Solutions, on Supersaturated. By C. Tomlinson, Esq., F.R.S., F.R.C.S. From the Author.

*————, Supersaturated Saline, Action of low temperatures on. By the same. From ditto.

*————, Sodic-sulphite, Constitution of. By the same. From ditto.

*Smithsonian Contributions to Knowledge, Vol. 16. From the Smithsonian Institution, Washington.

*—————, Miscellaneous Collections, Vol. 8-9. From ditto.

*————— Report, 1868. From ditto.

Snakes of Australia. By G. Krefft, Esq., C.M.Z.S., &c., Curator of Australian Museum, Sydney.

*Shells, Land of Tasmania. By Mr. W. Legrand. From the Author.

*Salmon experiment, Observations on. By M. Allport, Esq., F.Z.S. From the Author.

*Star η Argus and its Nebula. By F. Abbott, Esq., F.R.A.S., &c. From the Author.

*Sugar Beet, The. By F. Abbott, junr., Esq., Superintendent of Botanic Gardens. From the Author.

*Sheep Breeding. By S. Smith Travers, Esq. From the Author.

*Salmon Trout, On the. By M. Allport, Esq., F.Z.S., &c. From the Author.

*Transactions of Institution of Engineers in Scotland, Vols. 13 and 14. From the Institution.

*————— of New Zealand Institute. From Dr. J. Hector, F.R.S.

*Temperature, Surface, of South Atlantic Ocean, Charts of. From the Director, Meteorological Office, London.

*Timber Trees eligible for industrial culture in Victoria. By Baron F. Von Mueller, C.M.G., F.R.S., &c., &c. From the Author.

LIST OF PRESENTATIONS TO MUSEUM DURING 1871, WITH NAMES OF DONORS.

Abbott, Mr. F., jun.—A Blue Mountain Parrot *(Trichoglossus Swainsonii)*.

Allison, Mr. A., Macquarie River.—An Eel of a bright golden yellow colour.

Allport, Master C.—Four Copper Coins and Tokens.

Allport, Mrs. J.—A collection of Ferns from Madras.

Adelaide (South Australian Institute Museum).—A named collection of Bird Skins from the Northern Territory (56 specimens, comprising 36 varieties.)

Atkinson, Rev. H. D.—Three Geological Specimens from Peppermint and Birch's Bays.

Allport, M., Esq.—Specimen of Kauri Gum from New Zealand.

Baynton, W. E., Esq.—Land Shells from Brown's River. A specimen of "Native Bread."

Buckland, J., Esq.—Skin of Monitor Lizard.

Boyes, Mr. Lukin.—A pair of Musk Ducks *(Biziura lobata)*. A small Bat.

Bailey, Master F. G.—Butterflies from Ceylon. A Purse from the same place.

Blacklow, Mr., Brighton.—A Wedge-tailed Eagle *(Aquila fucosa)*.

Butler, Mrs., Executors of the late.—230 Specimens of Shells. An Earthenware Lamp from a tomb at Misenum, Naples. Portion of a Human Jaw from Pompeii. A small Earthenware Cup from an ancient tomb at Athens. Mosaics, &c., from Baiæ Beach, near Cumæ, Naples, &c., &c.

Browne, Mrs. Fielding.—23 Silver and 22 Copper Coins and Tokens, viz. :—*Silver :* One 5 lire, Italy, Napoleon 1., 1808 ; five 10 cents, ditto ditto, 1808 ; one 10 soldi, ditto, ditto, 1813 ; one franc, France, Charles X., 1826 ; one half ditto, ditto ditto, 1827 ; one ditto ditto, Louis Philippe, 1843 ; one ditto ditto, 1835 ; one coin, Spain, Philip V., 1738 ; one quarter dollar, ditto, Charles III., 1768; one ditto, ditto, Charles IV., 1799 ; one dime, America, 1845 ; ditto ditto, 1845 ; one half-crown, Bank of England token, George III., 1808 ; one shilling, colony of Essequibo, George III., 1808 ; one quarter, ditto ditto, 1816 ; two quarters (cut) of Spanish dollar, 2 unknown. *Copper :* One penny, George III. (?) ; one half ditto, George II., 1735 ; ditto, Prince of Wales (no date) ; one half anna, East India Co., 1845 ; one 20 cash, ditto, 1803 ; one coin, French Republic ; one coin, Isabella II., Spain, 1836 ; one ditto, Brazil, 1828 ; two ditto, Russia, 1831, &c. ; one 10 cents, Napoleon I. ; two doits, Java, &c. ; seven English and Colonial tokens.

Campbell, Mr. W. M., Port Cygnet.—A White Hawk *(Leucospiza Novæ Hollandiæ.)*

Clark, Mr. J.—A common Rat caught by a mussel on a pile of the Fish-market Wharf.

Chisholm, Mr. D.—An Arabic or Persian Coin, found at Clarence Plains. Specimens of Syngnathus and Hippocampus.

Cassidy, Mr. J.—A Spirifer (silicified) from Point Puer, Tasman's Peninsula.

Clifford, Mr.—Two Skulls of Wild Boars from New Zealand.

Dove, Mr. S.—A large Mussel Shell from the Derwent.

Dinham, Mr. G.—A Crown Piece of the "Gun Money" of James II., 1690.

Edgar, Mr. F. S.—Two Turtle Shells.

Fisher, Captain of the "Wild Wave."—Part of Tusk of Mastodon, from Siberia.

Felmingham, Mr.—A Cat Fish *(Uranoscopus sp.)*

Giblin, Mrs. W.—Two Specimens, Male and Female, of the Sydney Parrot, or King Lory *(Aprosmictus scapulatus)*.

Gates, Mr., Jerusalem.—A Diving Petrel *(Puffinaria urinatrix)* caught in a cornfield.

Gage, Mr. John.—A human skull, probably aboriginal, found on Mount Direction, Risdon.

Giblin, Mr. R.—A Kingfisher *(Alcyone azurea)*.

Gatenby, Mr. R., Macquarie River.—A male specimen of the Native Tiger *(Thylacinus cynocephalus)*.

Gourlay, Captain.—Two very large and fine shells of the Pearl Oyster, from the Solomon Island Group in the Pacific.

Graves, J. W., Esq.—A Photographic Copy of the deed of conveyance of Franklin Island by Lady Franklin in favour of the Tasmanian Acclimatisation Society. An English Sparrow.

Gomolka, Mr. H.—An extensive and valuable collection of New Zealand Birds (80), Fishes (13), Crustaceans (27), Shells (36); European Mammals (5), Birds (12), and South Australian Birds (7), Shells (33). These specimens were all collected, prepared, and mounted by the donor. Also a Mineral Specimen (Chromate of Lead) from Dun Mountain, New Zealand.

Hull, Master.—Nest and Eggs of Honey-eater.

Handley, Mr. T. B.—A Harpoon, much twisted, found in a whale captured off Macquarie Harbour by Captain Smith of the "Maid of Erin."

Hedberg, Mr. Oscar.—Tanned Skin of a Jaguar (?)

Holmes, Mr., Jerusalem.—A Green Parrot, unusually marked.

Haywood, Master A.—A Portugese Copper Coin, 1814.

Huston, Dr.—A Paradise Duck.

Hissey, Mr.—Skeleton of a Fox *(Canis vulpes.)*

Josephs, Mr. W.—A small Copper Coin, probably Persian, picked up at Clarence Plains.

Jefferson, Master Wm., Fernshawe, Victoria (per J. W. Graves, Esq.—Nest and Egg of Lyre Bird *(Menura superba)*, and four other nests, with eggs, from same locality.

Leefe, Lieut.—A small collection of Shells from Fiji.

Moir, Mr. J. G.—Fossils from the limestone near Brown's River.

Maclanachan, Hon. J., Esq., M.L.C.—A Carolina Duck *(Dendronessa sponsa)*. A ditto ditto.

Mitchell, Mr. J.—A French coin (dix centimes), Napoleon III, 1856.

Nash, Mr.—A German Lottery Ticket.

Officer, Sir Robert.—A large Geological Map. A Land Rail *(Rallus pectoralis)*.

Pearce, Mr. J.—Two American Notes ("Greenbacks,") value 50 cents and 10 cents.

Rowntree, Mr.—Polished Specimen of Native Myrtle *(Fagus Cunninghamii)*.

Read, R. C., Esq.—Specimen of Black Marble from the Florentine Valley, River Gordon, Tasmania. Specimen of Swainson's Lorikeet, shot at New Norfolk.

Reid, A., Esq., Ratho.—An Albino variety of the common Quail.

Ross, Mr., Battery Point.—A Snake said to be from Fiji.

Scott, Jas., Esq., M.H.A.—Nine Stone Implements made by the Aborigines of Tasmania, from Macquarie River.

Seal, M., Esq. (on behalf of the United Happy Valley Gold Mining Company).—A specimen of auriferous Quartz from Christmas Reef (very rich); ditto from new reef, Ovens, Victoria.

Smith, Mr., Port Davey.—Portions of Skull of Sperm Whale, two Pelvic bones of ditto, ear bones of ditto; curiously twisted saplings; nest and eggs of White Shafted Fantail *(Rhipidura albiscapa)*.

Stokell, G., Esq.—A perfect Skeleton of a Sandwich (?) Island Native.

Seal, M., Esq.—Fossil Seeds from a recent tertiary formation at Haddon, near Ballarat, Victoria.

Shone, T. A., Mr., Back River.—A curious horny growth from the haunch of a sheep.

Stephens, T., Esq.—A fine specimen of the large Australian Volute *(Voluta magnifica.)*. Travertine from Dunrobin.

Simpson, Mr. W.—An unusually large Egg of the Domestic Goose.

Saunders, Mrs. J., Hobart Town.—A singularly shaped Sponge from Recherche Bay.
Travers, S. Smith, Esq.—Collection of specimens illustrative of the carboniferous system of New South Wales; with notes on the same by W. Keene, Esq., F.G.S.
Tapp, Mr., ship "Figaro."—A Danish Coin, 1 mark.
Thorne, Mr. R., Pittwater.—Two specimens of Spine-tailed Swift *(Acanthylis caudacuta)*.
Tonkin, H. B., Esq.—Six fossils from Risdon.
Williams, Captain, of American whaler "Osmanli."—A collection of Shells, and a War Club, from Fiji. Four Shells from East Coast, Tasmania. An English Halfpenny Token, 1788.
Walker, E. T., Esq.—A Bow, 6 Arrows, and a branch of Coral used as a club, from Tanna, New Hebrides. Two Clubs, 2 pieces of Tapa Cloth, 3 Mats, a Pillow, 3 pieces of Sponge, sample of Sugar Cane, a piece of the root of a plant from which the drink called "Kava" is made, and two Beetles, from Fiji.
Wright, Mr. R., Glenorchy.—A Spine-tailed Swift.
Whitcomb, Mr. G.—A fine specimen of Kauri Gum from New Zealand.
Watchorn, Mr. W.—A Spider Crab.
Webb, Mr. B.—A Bronze Coin; a Copper ditto, Guernsey, 1834.
Wood, Mr.—A Whip Snake found alive in a hollow log of firewood.
Webb, Mr. E. J.—Two White Cockatoos *(Cacatua galerita)*.
Wiggins, Mr.—A species of Carp from Mauritius.
Weymouth, Mr.—A small Map of Tasmania published in 1830 by Ross. (This copy is believed to have been used by John Batman, whose name it bears.)

PLANTS AND SEEDS RECEIVED AT THE ROYAL SOCIETY'S GARDENS DURING 1871.

May 11th.—From Mr. E. B. Heyne, Seedsman, Adelaide.—21 packets seeds.
May 18th.—From Miss Huybers, Hobart Town.—20 packets seeds.
May 27th.—From Dr. R. Schömberg, Director Botanic Gardens, Adelaide.—One case containing 29 plants.
May 31st.—From Mr. C. Hollinsdale, Seedsman, Hobart Town.—57 varieties imported hyacinth.
June 23rd.—From Baron Von Müeller, Director Botanic Gardens, Melbourne.—One case containing 33 plants.
July.—From Dr. Hooker, Director Royal Botanic Gardens, Kew.—One box containing 499 packets seeds.
September 1st.—From Mr. G. Brunning, St. Kilda, Victoria.—One box containing 31 plants.
September 15th.—From Mr. J. Jones, Seedsman, Melbourne.—22 packets seeds.
November 3rd.—From the Melbourne Botanic Gardens.—One box containing 18 plants.
December 28th.—From J. R. Scott, Esq., New Town.—26 varieties bulbs.

PLANTS AND SEEDS SENT FROM THE ROYAL SOCIETY'S GARDENS DURING 1871.

January 21st.—By Her Majesty's ship "Blanche," to Dr. Schomburgh, Director of the Botanic Gardens, Adelaide.—One Case containing 42 plants.

February 18th.—Per "Runnymede," to Mons. J. Linden, Royal Zoological and Horticultural Gardens, Brussels.—Three Plants Dicksonia antarctica.

May 11th.—Per "Wagoola," to Mons. J. Linden, Brussels.—Three Plants Dicksonia antarctica.

May 31st.—Per "Harrowby," to Mons. J. Linden, Brussels.—Two large Plants Dicksonia antarctica.

September 6th.—To Mr. G. G. Brunning, St. Kilda Nurseries, Victoria. —Thirty Plants, 24 packets Seeds.

September 6th.—To Baron Von Müeller, Director Botanic Gardens, Melbourne.—24 packets Seeds.

TENCH SUPPLIED FROM THE POND IN ROYAL SOCIETY'S GARDENS DURING 1871.

February 14th.—J. Lord, Esq.—12 fish.
" 18th.—Mr. Witt.—6 fish.
May 2nd.—Rev. Canon Sharpe, Bathurst, New South Wales.—24 fish.
Total, 42 fish supplied during 1871.

PLANTS SUPPLIED FROM THE ROYAL SOCIETY'S GARDENS DURING THE YEAR 1871 FOR THE PLANTING OF PUBLIC PLACES.

July 5th.—For the Church of England Grounds, Bothwell.—100 Plants.

July 11th.—For the Grounds of the Roman Catholic Cathedral, Hobart Town.—140 Plants.

July 11th.—For the Grounds of the New Norfolk Asylum.—61 Plants.

July 11th.—For the Longford Church Grounds.—80 Plants.

July 14th.—For the Grounds of the Cascade Asylum.—140 Plants.

August 4th.—For the House of Correction, Hobart Town.—24 Plants.

August 4th.—The Public Works Office, for Franklin Square, Public Buildings, &c.—48 Plants.

August 8th.—For the Grounds of the Public Buildings, Launceston.—18 Plants.

August 8th.—For the Church Grounds, Green Ponds,—100 Plants.

August 18th.—For the Government House Grounds.—50 Plants.

PLANTS INTRODUCED INTO THE ROYAL SOCIETY'S GARDENS DURING 1871.

Abrus precatorius
Abutilon luteum erectum
" petuniœ florum
" vexillarium
Acanthus latifolius
" spinosus
Acer tataricum
Amaranthus melancholicus ruber
Amirola nitida
Aquilegia truncata
Aristolochia labiosa
Artemisia gracilis
Azalea pontica
" " globosa
" " grandiflora
" " macrantha
" " princeps
" miniata
Bahia lunata
Berberis asperima
" chinensis
" hypoglauca
" iberica
" sinensis
Betula fruticosa Gymelina
Bomaria multiflora
Bowenia spectabilis
Cassia grandiflora
Cassia Mary landica
" Senna
Caryota sobolifera
Centaurea Babylonica
" Clementii
Chenopodium scoparium
Chaenestes longipes
" officinalis
Cistus canescens
" dauricus
" incanus
" laurifolius
Clerodendron affine
Clivea nobilis
Colchicum byzantium
" striatum
" variegatum
Cotoneaster obovata
Crataegus Paul's scarlet
Crocus sativus
Cupressus Kewensis
Cydonia vulgaris
Cytisus alpinus
Delphinium Candalabrum
Dianthus deltoides
" dentosus
Diplacus Verchaffeltii
Echeveria bractealta
" retusa
Erica Candolleana
" Gilede
" Peteveri
" physoides
" stricta
" vagans
" willmoreana
Erinus alpinus albus
Erodium Muscarii
Gaultheria Shallon
Genista aphylla
" virgata
Gentiana acaulis
Gillia linifolia
Gloriosa virescens
Godetia Whitneyii
Grevillea manglesii
Helenium grandiflorum
Hibiscus Lambertii
Hypericum Kalmianum
Iberis tenoreana
Kunzea peduncalaris
Leptosiphon roseum
Livistonia olivaeformis
" rotundifolia
Lonicera Xyltosteum
Lycium Ruthenicum
Macleana calcagalli
Menziesia polifolia purpurea [globosa
Myrica cerifera
Ophiopappus rubiginosus
Papyrus antiquorum
Pharbitis Huberii variegata
Philadelphus Gordonianus
" grandiflorus
" " florabundus
" " laxus
" " speciosus
" tomentosus
Phleum pratensis variegata
Phytosperma Alexandrae
" rubicola
Poa pratensis variegata
Pyrethrum Schihatchewii
Pyrus sineusis
Rhus copallina
Rhus toxicodendron radicans
Ribes glutinosum
" atrosanguineum
Rubus Balfouriana
" biflorus

Rubus Borrerii
„ Cordifolium
„ leucostachya
„ Lindlyanus
„ Mucronulatus
„ occidentalis
„ parvifolius
„ rhamnifolius
„ rudis
„ Sprengelii
„ suberectus
„ thyrsoides
Salvia candalabrum
Schizanthus papilionaceus
Silene Schafta
Solanum robustum
Spiroea canescens
„ cancefolia
„ nutans argentea
„ Nobleana
„ opulifolia
„ opulifolia nana
Statice spicata
Tacsonia Dr. Wylde
Thunbergia javanica
Tilia europæa glauca
Venideum calendulaceum
Ziriphus mucronulatus

ROSE.

Baron Gonella
Camille Bernardin
Charles Rouillard
Climbing Devoniensis
Elie Morel
Fisher Holmes
Lady Emily Peel
Leopold Hausburg
Lord Herbert
Madame Barriot
„ Boutin
„ Calliat
„ Jeanne Marix
„ Pulliat
Souvenir d'Elise Varden

GERANIUM.

Carolina Longfield
Countess of Warwick
Duke of Edinburgh
Grand Duchesse Marie
L'Elegant
Madame Rose Charneaux
Princess Thyra
Rose Rendlater
Sparkhill Beauty
Sunset
Surpasse Beauty Suresnes
Tom Peuce Cerise
William Pfitzer

COLEUS.

Acquisition
Bewitching
Hon. Mrs. DuCane
Matchless
Prince Leopold
Refulgens

RANUNCULUS.

Calypso
Cicoque blanc
Enchantress
Fireball
Gloria Mundi
La Merveille
Leon d'Orange
Ophir d'Or
Orange Maxima brilliant
Perle blanc
Persiana
Regina Flora
Rougeater
Saturnus
Temple Van Opollo
Theodora
Utopia

F. ABBOTT, Jun.

PRINTED AT THE "MERCURY" STEAM PRESS OFFICE.

3 2044 089 270 664